



# **The Avogadro Group, LLC**

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## **SOURCE TEST PROTOCOL 2016 EMISSION COMPLIANCE TESTS AND CEMS RATA AT THE LOS MEDANOS ENERGY CENTER PITTSBURG, CALIFORNIA**

Prepared For:

**Calpine Corporation**  
1200 Arcy Lane  
Pittsburg, California 94565

For Submittal To:

**Bay Area Air Quality Management District  
California Energy Commission  
U. S. EPA Region IX**

Prepared By:

**The Avogadro Group, LLC dba MAQS Antioch**  
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May 18, 2016



## REVIEW AND CERTIFICATION

I certify that to the best of my knowledge the information in this test protocol is complete and accurate and conforms to the requirements of the MAQS Quality Manual.

Name: Andrew Berg, OSTI

Title: Senior Project Manager

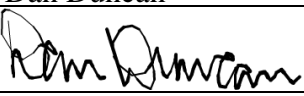
Sign: 

Date: 6/08/2016

I have reviewed, technically and editorially, details, calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that to the best of my knowledge the presented material is authentic and accurate and conforms to the requirements of the MAQS Quality Manual.

Name: Dan Duncan

Title: QA/QC Manager

Sign: 

Date: 06/08/2016

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## SUMMARY INFORMATION

**Permit Number:** BAAQMD Permit to Operate for Facility #1866

### **Source and Contact Information**

Source Location: Los Medanos Energy Center  
750 East Third Street  
Pittsburg, California 94565

Project Contact: Ms. Maria Barroso  
Title: Compliance Specialist  
Calpine Delta Projects

Telephone: (925) 529-8286

Regulatory Agency: Bay Area Air Quality Management District  
California Energy Commission  
U.S.E.P.A. Region IX

Units: General Electric 7FA gas turbine engine (S-1) with heat recovery  
steam generator (S-2);  
General Electric 7FA gas turbine engine (S-3) with heat recovery  
steam generator (S-4);  
One 246 MMBtu/hr auxiliary boiler (S-5)

Purpose: Determination of compliance with permit conditions, RATA

Test Methods: EPA Methods 1, 2, 3A, 4, 7E, 10, 18 (TO-12), 19 and 5/202;  
ASTM Method D-5504

### **Testing Company Information**

Testing Firm: The Avogadro Group, LLC dba Montrose Air Quality Services  
2825 Verne Roberts Circle  
Antioch, California 94509

Contacts: Mr. Andrew Berg                      Mr. Kevin Crosby  
Senior Project Manager                  Client Account Manager

Telephone: (925) 234-1385                  (925) 680-4337  
Facsimile: (925) 680-4416                  (925) 680-4416

Test Dates: August 15 through August 19, 2016



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## SECTION 1.0

### INTRODUCTION

#### 1.1 TEST PROGRAM SUMMARY

The Avogadro Group, LLC dba Montrose Air Quality Services (MAQS), has been contracted by Calpine Corporation (Calpine) to perform a series of source emission tests at the Los Medanos Energy Center (LMEC) in Pittsburg, California. The testing program will be performed to determine compliance with the emission limitations of the facility's permit for Plant Number 11866 issued by the Bay Area Air Quality Management District (BAAQMD).

Emissions will be measured from two gas turbines (S-1 and S-3) with heat recovery steam generators (HRSG) (S-2 and S-4) and from one natural gas-fired auxiliary boiler (S-5). Some of the test runs will also provide a relative accuracy test audit (RATA) of the continuous emission monitoring system (CEMS) on each unit.

MAQS will mobilize a testing van to the site, and will provide a professional source test team to conduct the testing as described in this protocol. The test team members assigned to this project are familiar with the proposed test methods and procedures.

MAQS will perform emission tests as described in Conditions 39 and 40 of the BAAQMD permit for Plant # 11866. The measurements will include the following emission parameters:

- Part 60 and Part 75 CEMS Certification Tests (O<sub>2</sub>, CO, NO<sub>x</sub>)
  - RATA on outlet analyzers
- Emission Compliance at Maximum Load on the turbines:
  - CO (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - NO<sub>x</sub> (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - POC (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - Methane and ethane (ppmvd)
  - SO<sub>2</sub> (fuel sulfur gr/100scf, stack ppm volume dry and lb/hr)
  - Filterable and Condensable PM<sub>10</sub> (gr/dscf, gr/dscf @ 12% CO<sub>2</sub>, lb/hr, lb/day)
  - O<sub>2</sub> and CO<sub>2</sub>, (% volume dry)
  - Stack volumetric flow rate (dscfm) and moisture content (% volume)
  - Fuel analysis (sulfur content)



- Emission Compliance at Minimum Load on the turbines:
  - CO (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - POC (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
- Emission Compliance on the Auxiliary Boiler:
  - CO (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - NO<sub>x</sub> (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - POC (ppm volume dry, ppm @ 15% O<sub>2</sub>, lb/hr, lb/MMBtu)
  - Methane and ethane (ppmvd)
  - SO<sub>2</sub> (fuel sulfur gr/100scf, stack ppm volume dry and lb/hr)
  - Filterable and Condensable PM<sub>10</sub> (gr/dscf, gr/dscf @ 12% CO<sub>2</sub>, lb/hr, lb/day)
  - O<sub>2</sub> and CO<sub>2</sub>, (% volume dry)
  - Stack volumetric flow rate (dscfm) and moisture content (% volume)

MAQS will not perform the toxic emission tests required once every five years by Condition 42 of the BAAQMD permit for Plant #11866 since these tests were performed in 2012.

MAQS will provide the test personnel and all necessary equipment to measure emissions as outlined in this protocol and will subcontract an analytical laboratory for the fuel sample analysis. Calpine personnel will coordinate the unit operating conditions and will provide the process data to be included in the final report. The results of the tests will be presented in a final report, copies of which will be delivered to Calpine for distribution.

This test protocol provides descriptions of the facility and test locations, descriptions of the testing program and test procedures, a proposed program schedule, a typical report format and a summary of our quality assurance and safety programs.





## SECTION 2.0

### TESTING CONTRACTOR

The test program will be conducted by MAQS. Analysis of the particulate matter emission samples will be conducted in MAQS's analytical laboratory. MAQS contacts for the project will be:

- Project Manager: Andrew Berg (925) 234-1385
- Account Manager: Kevin Crosby (925) 680-4337

MAQS is a recognized independent contractor that has been approved to conduct emission source testing on behalf of the California Air Resources Board (CARB), pursuant to Section 91200-21220, Title 17, of the California Code of Regulations. MAQS is an Air Emission Testing Body (AETB) as defined in 40 CFR 72.2, conforming to ASTM D7036-04 as it pertains to 40 CFR Part 75. Certificates are provided in Appendix B of this test plan. MAQS is a full service source testing and combustion engineering consulting firm with extensive experience in air quality management and pollution control.

The test team members assigned to this project are familiar with the testing of natural gas-fired turbines and have been selected based on specific experience and proficiency with the methods to be used. All RATA and performance tests will be overseen and supervised onsite by at least one Qualified Individual, as defined in 40 CFR 72.2. Table 2-1 lists the assigned key test program personnel. Some or all of the personnel listed will take part in the project.

**TABLE 2-1**  
**KEY TEST PROGRAM PERSONNEL**  
**LOS MEDANOS ENERGY CENTER**

Personnel	Title	Assignment	Experience
Kevin Crosby	Technical Director	Account Manager	Since 1978
Dan Duncan	QA/QC Manager	Quality Assurance	Since 1987
Andrew Berg	Senior Project Manager	Project Manager	Since 1999

Mr. Andrew Berg will be project manager for the air sampling activities at Los Medanos Energy Center. Mr. Berg's responsibilities include overseeing the execution and



planning of all air sampling efforts including testing, reporting and project coordination. His primary objective is to ensure that the results generated by this test program will meet the expectations and requirements of both the regulatory agencies and Calpine.

Mr. Dan Duncan has been appointed as the Quality Assurance Officer for the project. He will review and validate the test results, lab analyses, and the final report. A summary of our standard QA/QC program is presented in Section 5.0.

Mr. Kevin Crosby will act as Account Manager for the project. His responsibilities will include oversight of all the project activities. He will ensure that each phase of the project will have the resources necessary to meet the project objectives and the data quality objectives.

The on-site activities will also include technicians and other support personnel chosen based on specific experience of the methods to be used throughout the program and schedule availability. Our website at [www.avogadrogroupp.com](http://www.avogadrogroupp.com) provides additional information on our company and personnel assigned to this project.



## SECTION 3.0

### FACILITY DESCRIPTION

#### 3.1 UNIT DESCRIPTION

The LMEC facility is located at 750 East 3<sup>rd</sup> Street, to the west of the USS/POSCO steel mill in Pittsburg, California. The facility is rated to generate electrical power for the California power grid, and to provide process steam to USS/POSCO.

The facility includes two General Electric 7FA gas turbine engines, each with dry low-NO<sub>x</sub> combustors, and with a heat recovery steam generator (HRSG). Each Nooter-Ericksen HRSG includes supplementary duct burners (with low-NO<sub>x</sub> burners) for additional steam production, and SCR and reduction catalysts for emission control. The exhaust gases from each gas turbine and HRSG are ducted to vertical, cylindrical stacks.

There is one auxiliary boiler, fired with natural gas and rated at a heat input of 320 MMBTU/hr. The Nebraska Boiler unit has a Coen low-NO<sub>x</sub> burner with FGR, and includes a Peerless selective catalytic reduction (SCR) unit for further control of NO<sub>x</sub> emissions. The exhaust from the boiler is ducted to a vertical, cylindrical stack.

#### 3.2 SAMPLING LOCATIONS

Each turbine/HRSG exhausts through a vertical, cylindrical stack that is 139 feet tall. These identical stacks have an inside diameter of 19.5 feet (234 inches) and have eight sampling ports, located 45 degrees apart in the same horizontal plane. The ports are 6-inch pipe sections with flanges (150 psi rating type) and caps. Access to the ports on each unit is by stairway to the top of the HRSG, then by ladder the last 50 feet to a permanent platform approximately 110 feet above ground level. The ports are approximately 50 feet (2.5 stack diameters) downstream from (or above) the HRSG duct, and 24 feet (1.2 diameters) upstream from the top of the stack. A sketch of the stack layout is included in Appendix C. Sampling traverse points will be located according to EPA Method 1.

The auxiliary boiler exhausts through a vertical, cylindrical stack that is 89 feet tall. The stack has an inside diameter of 6.5 feet (78 inches) and has eight sampling ports, located 45 degrees apart in the same horizontal plane. The ports are 4-inch pipe sections with flanges (150 psi rating type) and caps. Access to the ports is by ladder to a permanent platform at 45 feet above ground level. The ports are approximately 32 feet (4.9 stack diameters) downstream from (or above) the boiler outlet duct, and 35 feet (5.4 diameters) upstream from the flow restrictor at the top of the stack. A sketch of the stack layout is



included in Appendix C. Sampling traverse points will be located according to EPA Method 1.



## SECTION 4.0

### TEST DESCRIPTION

#### 4.1 PROGRAM OBJECTIVES

The testing program will be conducted to address the conditions of the BAAQMD permit to operate. The permit conditions to be addressed by the testing program are listed in Table 4-1.

**TABLE 4-1  
PROGRAM OBJECTIVES  
LOS MEDANOS ENERGY CENTER GAS TURBINES**

Source	Test Type	Test Parameters
Gas Turbine Units 1, 2 and 3 (minimum load)	Compliance, PTO Condition 39	O <sub>2</sub> , CO POC (and methane and ethane)
Gas Turbine Units 1, 2 and 3 (maximum load)	Compliance, PTO Condition 39	O <sub>2</sub> , CO <sub>2</sub> , CO, NO <sub>x</sub> POC (and methane and ethane), Total PM as PM <sub>10</sub> , SO <sub>2</sub> , Flow rate and Moisture
CEMS 1, 2 and 3	RATA PTO Condition 39	O <sub>2</sub> , CO, NO <sub>x</sub> concentrations, lb/MMBTU, lb/hr
Auxiliary Boiler	Compliance, PTO Condition 40	O <sub>2</sub> , CO <sub>2</sub> , CO, NO <sub>x</sub> POC (and methane and ethane), Total PM as PM <sub>10</sub> , SO <sub>2</sub> , Flow rate and Moisture
Auxiliary Boiler	RATA PTO Condition 40	O <sub>2</sub> , CO, NO <sub>x</sub> concentrations, lb/MMBTU, lb/hr

There are therefore two objectives of this testing program. Some of the tests will determine **compliance** with the source testing conditions of the permit issued by the BAAQMD. Additional tests will be performed to **audit** the performance of the CEMS (i.e. 40 CFR Parts 60 and 75 RATA). The final report will present the results of the emission tests and will compare them to the applicable performance specifications and permit limits. The results will be presented in units consistent with those reported by the CEMS and those listed in the permit. The permit limits will be utilized as the “applicable standards” for alternate pass / fail criteria in reporting RATA results.



## 4.2 TEST CONDITIONS

The compliance tests will be conducted on the gas turbines at two load conditions as described in Condition 39 of the BAAQMD permit:

- “...while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load...” (i.e. with maximum duct burner firing)
- “...while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load...” (i.e. with no duct burner firing)

If additional RATA runs are needed, the turbine units will be operated at base load. Test conditions will be established on site by Calpine personnel.

The compliance tests will be conducted on the auxiliary boiler at one load condition as described in Condition 40 of the BAAQMD permit:

- “...while the Auxiliary Boiler is operating at maximum allowable operating rates...”

## 4.3 TEST PROGRAM SCHEDULE

The test program will be completed in a single mobilization. The schedule is presented in Table 4-1. Since the operation schedule of a power plant can be unpredictable at times, MAQS and Calpine may modify the testing sequence while on site.

The PM runs will each be 150 minutes in duration. The other shorter-duration tests will be conducted during those longer test runs, so there will be several test runs in operation at the same time. The results of the RATA test runs will be used to determine compliance as well as to calculate the CEMS relative accuracy.



**TABLE 4-1  
PROPOSED TESTING SCHEDULE  
LOS MEDANOS ENERGY CENTER  
GAS TURBINES AND AUXILIARY BOILER**

Date	Activity / Parameter	Test Run	Run Duration
August 12, 2016 <b>Turbine 1</b>	Mobilization, set-up on Turbine 1	--	--
August 15, 2016 <b>Turbine 1</b>	<b>Minimum</b> Load Test, CO, POC	1, 2, 3	30 min. each
	<b>Maximum</b> Load Test, PM	1	150 min. each
	NO <sub>x</sub> , CO, O <sub>2</sub> (includes RATA)**	1 to 4**	21 min. each
	POC (plus methane and ethane)	1	30 min. each
August 16, 2016 <b>Turbine 1</b>	<b>Maximum</b> Load Test, PM	2, 3	150 min. each
	NO <sub>x</sub> , CO, O <sub>2</sub> (includes RATA)**	5 to 12**	21 min. each
	POC (plus methane and ethane)	2, 3	30 min. each
	Fuel Sulfur*	1	grab
	--	--	--
<b>Turbine 2</b>	<b>Move to Turbine 2</b>	--	--
August 17, 2016 <b>Turbine 2</b>	<b>Minimum</b> Load Test, CO, POC	1, 2, 3	30 min. each
	<b>Maximum</b> Load Test, PM	1	150 min. each
	NO <sub>x</sub> , CO, O <sub>2</sub> (includes RATA)**	1 to 4**	21 min. each
	POC (plus methane and ethane)	1	30 min. each
	Fuel Sulfur*	1	grab sample
August 18, 2016 <b>Turbine 2</b>	<b>Maximum</b> Load Test, PM	2, 3	150 minutes
	NO <sub>x</sub> , CO, O <sub>2</sub> (includes RATA)**	5 to 12**	21 min. each
	POC (plus methane and ethane)	2, 3	30 minutes
	--	--	--
<b>Auxiliary Boiler</b>	<b>Move to Auxiliary Boiler</b>	--	--
August 19, 2016 <b>Auxiliary Boiler</b>	<b>Maximum</b> Load Test, PM	1, 2, 3	150 min. each
	NO <sub>x</sub> , CO, O <sub>2</sub> (includes RATA)**	1 to 12**	21 min. each
	POC (plus methane and ethane)	1, 2, 3	30 min. each
	Fuel Sulfur*	1	grab
Within 45 days after test	DRAFT Report Submittal	--	--
Within 50 days after test	FINAL Report Submittal	--	--

Note: The turbine units may be tested in any order, depending on operations. Each unit must operate with maximum duct burner fire and steam augmentation during the maximum load tests.

\* A single fuel sample will be collected during the tests on each turbine unit.

\*\* There will be at least 9 and up to 12 RATA test runs conducted at each site.



#### 4.4 TEST PROCEDURES

MAQS will use a mobile laboratory on site for the purposes of this testing program. The mobile lab is equipped with laboratory space as well as the CEM system. There is sufficient room to work in the mobile test van with spacious counter tops for sample recovery, calculation of results and completion of the sample chain of custody forms. Samples will be stored and refrigerated in a designated locked area under strict chain of custody guidelines.

The emission tests will be conducted according to the reference methods. Each test method will be used as a laboratory and field reference. The reference methods are very complete in their description of the procedures. Each method has specific requirements for quality assurance that will be followed for preparation of the sampling reagents and apparatus, for sampling and sample recovery, for shipping and handling, and for laboratory analysis. We have not re-stated the method requirements in this test plan, but have described the application of the methods to the sources to be tested.

The test methods and procedures that will be used in this program are listed in Table 4-2. Generic descriptions of the test methods are included in Appendix A. The site-specific applications and/or modifications to the methods are described in the sections that follow. Each description lists the version of the test method that will be used as a reference, and the sections of the method for which choices must be made, or for which specific modifications are planned. Where conflicts exist in the descriptions, the version here in Section 4.0 will take precedence.





**TABLE 4-2**  
**EMISSION TEST PARAMETERS AND METHODS**  
**LOS MEDANOS ENERGY CENTER**

Test Parameter	Reference Method	Reporting Units	Detection Limits
<b>Criteria Pollutants:</b>			
O <sub>2</sub> and CO <sub>2</sub>	EPA 3A	% volume dry	< 2% of full scale
CO and NO <sub>x</sub>	EPA 10 and EPA 7E	ppmvd @ 3% O <sub>2</sub> , ppmvd @ 15% O <sub>2</sub> , lb/hr, lb/MMBtu	< 2% of full scale
Volumetric Flow	EPA Method 19	dscfm	--
POC (compliance)	EPA TO-12	ppmvd @ 3% O <sub>2</sub> , ppmvd @ 15% O <sub>2</sub> , lb/hr, lb/MMBtu	< 0.1 ppm
Methane and ethane	EPA 18 (from TO-12 cans)	ppmvd	< 0.1 ppm
SO <sub>x</sub> as SO <sub>2</sub>	ASTM D-5504 (fuel) EPA 19	lb/hr, lb/MMBtu	< 0.1 ppm
TPM as PM <sub>10</sub>	EPA 5/202	gr/dscf @ 15% O <sub>2</sub> , lb/hr, lb/MMBtu	< 0.0005 gr/dscf
Relative Accuracy Test Audit (RATA)	40 CFR 60, Appendix B, 40 CFR 75, Appendix A	Calculation from test results	--

#### **4.4.1 Gaseous Emissions**

Concentrations of the gaseous constituents of the stack gas (CO, NO<sub>x</sub>, O<sub>2</sub> and CO<sub>2</sub>) will be measured using MAQS's dry extractive continuous emissions monitor (CEM) system described in Appendix A. This system meets the requirements of EPA and CARB methods for gaseous species. A heated Teflon line and chilled knockout system will be used to prevent loss of NO<sub>2</sub> in the sampling system. The NO<sub>x</sub> analyzer will be operated in the NO<sub>x</sub> mode to measure NO plus NO<sub>2</sub>. A molybdenum catalyst converter is used to convert NO<sub>2</sub> to NO for measurement of total NO<sub>x</sub>.

The tests will be performed during two conditions according to the parameters in Table 4-1. A preliminary traverse will be conducted from at least 12 traverse points to determine the stratification of the stack gases. The results will be used in selection of the traverse points to be used for the subsequent emission test runs. In the event that the stack gas concentrations differ by no more than 10% from the average value, three representative sampling points will be located according to 40CFR75, Appendix A to be



used for the remaining tests. If the stack gas concentrations differ by no more than 5% from the average value, a single representative sampling point will be located according to 40CFR75, Appendix A to be used for the remaining tests.

The sample conditioning and delivery system includes components to extract a representative sample from the source, remove the moisture and particulate matter from the sample stream, and transport the sample to the analyzers. The main components are:

- 1) A quartz, titanium, stainless steel or glass probe - heated or insulated as necessary to avoid condensation,
- 2) Sample filtration – filters located on the probe, pump, and prior to all of the analyzers for removal of particulate matter,
- 3) Teflon tubing - connecting the probe to the sample conditioner and the sample conditioner to the analyzer manifold - heated or insulated as necessary to avoid condensation,
- 4) Sample conditioner - glass or stainless steel flasks immersed in an ice bath to remove the moisture from the sample gas stream,
- 5) Vacuum pump - a leak-free pump with Teflon diaphragm to transport the sample gas through the system,
- 6) Sample manifold - a distribution system, constructed of stainless steel and Teflon tubing, to direct sample gas to the analyzers, and
- 7) Sample flow rate control - a series of rotameters, vacuum gauges and pressure gauges connected to the manifold used to maintain the appropriate sample flow rates.

The calibration gas system utilizes only EPA Protocol gases to verify the operation, linearity, and range settings of the electronic analyzers. The sample gas system allows for the introduction of the protocol gases to the analyzers either directly through the manifold (calibration error check - performed once daily) or through the sampling system (system bias check - performed with each run).

The electronic analyzers are rack-mounted and are maintained in the mobile lab. The data recording and acquisition system is based on a digital system known as MoleDAQ. It includes software for controlling the collection of calibration and emission monitoring data, and hardware for connection of the analyzer outputs to the recording system.

Test results can be provided in three forms: on-site printouts of the digitized data, diskette recordings of the digitized data, and strip charts from the monitoring data. For this test program, on-site printouts of the one-minute averages will be provided in the final report.



#### **4.4.2 Total Particulate Matter as PM<sub>10</sub> Emissions (PM<sub>10</sub>)**

The concentrations and emission rates of total PM will be measured as PM<sub>10</sub> using a combination of EPA Methods 5 and 202 ("dry impingement" as updated in December 2010). The measurements will include filterable and condensable particulate matter (CPM). The Method 5 samples will be handled as described in the method. The Method 202 samples will also be handled as described in Method 202, including the use of "dry" impingers and the required post-test nitrogen purge. Test runs will be of sufficient duration to collect sufficient sample volume to provide detection limits low enough to meet the objectives of the testing program.

The apparatus will include a borosilicate glass sampling probe attached to an oven containing a heated glass filter holder and filter. The filter holder will be connected by a length of Teflon tubing to the impinger train. The impinger train will be connected to the control box, which contains the sampling pump and dry gas meter. The sampling rate and nozzle size will be chosen to allow isokinetic sampling at the calculated rate.

The filterable "front-half" PM will be recovered from the sampling apparatus as described in EPA Method 5. The sample will include the probe and nozzle wash, filter, and rinses from the front-half of the filter holder. The sample will be analyzed gravimetrically to determine the concentration of filterable PM and will be counted as PM<sub>10</sub>.

The impinger train or "back-half" contents will be recovered and analyzed for condensable PM<sub>2.5</sub> as described in EPA Method 202. After sampling, the "front-half" cyclones and filter will be removed from the tip of the probe, and a leak check will be conducted from the probe extension through the impinger train. Then the probe extension and condenser will be rinsed with a known amount of water into the first impinger or dropout (i.e. with the sampling pump running), the pump will be turned off and the probe extension will be disconnected from the impinger train. The probe extension will then be rinsed with acetone and hexane into the organic rinse sample bottle (#2). The impinger train will be capped and it and the organic rinse sample will be transported to the mobile laboratory.

In the mobile laboratory, the first and second impingers will be weighed to determine the mass of moisture collected. The contents of the first impinger will be rinsed with water into the second impinger, and water will be added as necessary for the subsequent purge. Then the condenser and first impinger will be reattached to the second impinger and the condenser, impingers and CPM filter will be purged with nitrogen for one hour.

After the purge, the sample will be recovered in three fractions. These will include (#3) the CPM filter, (#1) the water contents and rinses of the condenser, impingers, and filter holder, and (#2) the acetone and hexane rinses of the condenser, impingers, and filter holder. The sample containers will be transported to the MAQS laboratory for analysis.



In the laboratory, the samples will be processed and analyzed as described in Methods 5 and 202, including gravimetric measurement of the residue from the filter, probe acetone rinse, and the aqueous, organic and filter fractions of CPM. The corrected results will be used to determine the concentration of filterable and condensable PM.

#### **4.4.3 Relative Accuracy Test Audit and Bias Test**

Each turbine unit has its own continuous emissions monitoring system (CEMS) and continuous emissions rate monitoring system (CERMS) measuring dry-basis outlet concentrations of O<sub>2</sub>, CO and NO<sub>x</sub> and inlet concentrations of NO<sub>x</sub>. Only the outlet analyzers will be addressed during this program. At least nine 21-minute test runs will be performed to complete the RATA of each system as specified in 40 CFR, Part 60, Appendices B and F and 40 CFR, Part 75, Appendix A. Relative accuracy will be calculated in the following units:

- O<sub>2</sub> analyzers, % volume dry
- CO analyzers, ppm @ 15% O<sub>2</sub>, lb/hr
- NO<sub>x</sub> analyzers, ppm @ 15% O<sub>2</sub>, lb/MMBtu
- The NO<sub>x</sub> RATA run results will also be used to calculate the bias adjustment factor (BAF) for reporting under Part 75.

For each reference method (RM) determination, the flue gas will be sampled at a number of traverse points that will be determined prior to testing using EPA Method 1 procedures. The differences between the RM sample and the pollutant monitor's readings will be evaluated from a minimum of nine sets of paired monitor and RM test data. From these differences, the 95% confidence coefficient will be calculated, and the relative accuracy determined. Any tests not included in the calculations for the determination of relative accuracy (maximum of three) will still be included in the final test report.

The relative accuracy of the O<sub>2</sub> analyzer will be determined in accordance with 40 CFR, Part 75, Appendix A, Section 3.3.3. The O<sub>2</sub> RATA results are acceptable if relative accuracy does not exceed 10.0% (semiannual criteria). Alternately, results are acceptable if the mean difference of the O<sub>2</sub> monitors' measurements and the corresponding RM measurements are within  $\pm 1.0\%$  O<sub>2</sub> (40 CFR, Part 60, Appendices B, Performance Specification 3). Under the incentive program, if the RATA results are  $\leq 7.5\%$  or if the mean difference does not exceed  $\pm 0.7\%$  O<sub>2</sub>, then the next RATA can be performed on an annual basis rather than semiannually.

The relative accuracy of the NO<sub>x</sub> analyzer will be determined in accordance with 40 CFR, Part 75, Appendix A, Section 3.3.2. The NO<sub>x</sub> RATA results are acceptable if relative accuracy does not exceed 10.0% (semiannual criteria). Alternatively, if during the RATA the average NO<sub>x</sub> emission rate is less than or equal to 0.20 lb/MMBtu, the mean value of the NO<sub>x</sub> CEMS must not exceed  $\pm 0.02$  lb/MMBtu of the RM mean value.



The alternative criteria will only be utilized if the 10% relative accuracy requirement is not achieved. Under the incentive program, if the RATA results are  $\leq 7.5\%$  then the next RATA can be performed on an annual basis rather than semiannually. Alternately, if the average  $\text{NO}_x$  emission rate is less than or equal to 0.20 lb/MMBtu, the mean difference must not exceed  $\pm 0.015$  lb/MMBtu for annual pass/fail criteria.

In accordance with 40 CFR, Part 60, Appendix B, Performance Specification 2,  $\text{NO}_x$  relative accuracy test results (concentrations only) are acceptable if the  $\text{NO}_x$  relative accuracy does not exceed 20% of the mean value of the RM test data in terms of units of the emission standard (if the average RM results are above 50% of the applicable standard) or 10% of the applicable standard (if the average RM results are below 50% of the applicable standard).

In accordance with 40 CFR, Part 60, Appendix B, Performance Specification 4A, CO relative accuracy test results (concentrations only) are acceptable if the relative accuracy of the CEMS is no greater than 10% when the average RM value is used to calculate relative accuracy or 5% when the applicable emission standard is used to calculate relative accuracy. Alternately, the CO relative accuracy test results are acceptable when the relative accuracy is calculated to be less than 5 ppm as the absolute average difference between the RM and CEMS, plus the 2.5% confidence coefficient.

Since the CO and  $\text{NO}_x$  analyzers incorporate equipment for the determination and reporting of pollutant mass emission rates (lb/hr and lb/MMBtu), the systems are technically defined as CERMS. In accordance with 40 CFR, Part 60, Appendix B, Performance Specification 6, relative accuracy test results for mass emissions are acceptable if the RA of the CERMS is no greater than 20 percent of the mean value of the RM test data in terms of the units of the emission standard, or 10 percent of the applicable standard, whichever is greater.

#### **4.4.4 Precursor Organic Compounds**

Precursor organic compounds (POC) are defined in the ATC as “any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, carbonates and ammonium carbonate”. For steady load conditions (i.e. compliance testing), the concentrations of POC will be measured using EPA Method 18. The sampling and analysis will be conducted according to EPA Compendium Method TO-12 in order to provide low enough detection limits (note that the emission limits for POC equate to approximately 1 ppm).

The concentrations of methane and ethane will be analyzed (as required by the permit; these results will not be used in any emission calculations for POC) without pre-concentration by GC-FID.



Flue gas samples will be collected in specially-prepared evacuated stainless-steel (SUMMA) canisters. Sample gas will be drawn through a probe and connecting line of Teflon tubing through a calibrated flow controller into each canister. Sampling will end leaving a residual vacuum of at least 5 inches of mercury; this will prevent condensation of water within the canister (note that stack gas moisture content is expected to be 8 to 14% by volume). The samples will be analyzed by cryogenic pre-concentration and GC/FID.

Triplicate 30-minute sampling runs will be conducted on each unit as specified in Table 4-2. Each test run will be performed at a flow rate of approximately 0.1 liters per minute at one atmosphere. After sample collection, the canisters will be transported to the laboratory for cryogenic pre-concentration and flame ionization detection analysis as described in Method TO-12 within 14 calendar days. The expected detection limit is on the order of 10 ppb by volume.

Results will be reported as concentrations of non-methane non-ethane organic compounds as heptane (and will be converted to the basis “as methane”). The canisters will be prepared and analyzed by AA&C of Ventura, California.

#### **4.4.5 Fuel Analysis and SO<sub>2</sub> Emissions**

Calpine will provide analytical data for the fuel during each test day. The data will include the higher heating value and the EPA Fd factor. The data will be provided by Calpine’s process instrumentation and will be used to document the heat input to each unit. The process instrumentation will also provide fuel flow rates.

Emissions of sulfur dioxide (SO<sub>2</sub>) will be calculated from the fuel sulfur content and fuel flow rate, assuming 100% conversion of fuel sulfur to SO<sub>2</sub> emissions. The sulfur content of the fuel will be measured by sampling the fuel into a Tedlar bag, then analyzing the samples for trace sulfur compounds using ASTM Method D-5504. One sample from each turbine’s natural gas fuel supply pipeline will be collected on the day of maximum-load testing. Each sample will be submitted to the subcontract laboratory for analysis within 72 hours of sampling.

If a fuel sample becomes compromised in any way (i.e. leakage, air dilution, problems with the laboratory analysis), MAQS will use the results from one of the other units, since the gas is routed from a common duct.



#### **4.4.6 Emission Rates, Volumetric Flow Rates and Moisture Content**

Emission rates will be calculated in units of lb/MMBtu from the measured concentrations and fuel factors using EPA Method 19. The stack gas volumetric flow rates will also be calculated from the fuel heat input rates using Method 19. Emission rates will be calculated in units of lb/hr or other mass flow units from the measured concentrations and the calculated volumetric flow rates.

Stack gas velocities will be measured using EPA Methods 1 and 2. The stack gas moisture contents will be measured according to EPA Method 4 in conjunction with the PM test runs. O<sub>2</sub> and CO<sub>2</sub> concentrations will be provided from the concurrent EPA Method 3A test runs. The results will be used in calculation of the sampling rate factors for the PM test runs.

#### **4.4.7 Process Data**

Process conditions will be controlled and documented by LMEC personnel. The plant data presented in the report will include:

- Fuel heat input, MMBtu/hr (for the gas turbine units this includes separate data for the combustion turbine and duct burner fuel flows)
- Gross MW generated by each gas turbine
- Unit load as defined for 40CFR75 (for the gas turbine units)



## **SECTION 5.0**

### **QUALITY ASSURANCE AND REPORTING**

#### **5.1 SAMPLING AND ANALYTICAL QA/QC**

MAQS has instituted a rigorous QA/QC program for all of its air pollution testing. The program ensures that the emission data reported are as accurate as possible. The procedures included in the cited reference methods will be followed for all steps of preparation, sampling, calibration, and analysis. MAQS will be responsible for preparation, calibration and cleaning of the sampling apparatus. MAQS will also conduct the sampling and sample recovery, storage and shipping.

Contract laboratories will conduct some of the preparation and sample analyses. The laboratories that will be used are established leaders in development and performance of the reference methods for which they have been selected. Their credentials for adherence to the required quality assurance procedures are well known.

#### **5.2 QUALITY CONTROL REQUIREMENTS**

Our Quality Assurance Program Summary, located in Appendix B, provides our equipment maintenance and calibration schedule, quality control acceptance limits, and any corrective action that may be needed. For additional quality control, MAQS will follow the procedures outlined below:

- Preliminary stack flow and temperature measurements will be taken to assure correct isokinetic sampling.
- All field equipment will undergo a visual inspection prior to testing and will include pre-test calibration checks.
- Glassware will be visually inspected and will be given a final field rinse prior to testing.
- Reagents will be made fresh daily where needed. A new reagent blank will be retained for every new stock of reagent.

#### **5.3 QUALITY ASSURANCE AUDITS**

Quality assurance audits will be conducted as part of the test program to ensure that the final results are calculated from the highest quality data. The audits are listed below:

- The dry gas meters used for the outlet sampling locations will be calibrated using a critical orifice (with a known calibration factor) before the





commencement of the testing program. The meters will then be checked immediately following the program. The meter values must agree within  $\pm 5$  percent of the orifice value. If the meters do not pass, the results will have to be evaluated as to their accuracy.

- The S-type pitot tubes used during the test program will be calibrated using a wind tunnel and standard pitot tube. The S-type pitots will again be checked following the test program and must be within  $\pm 3$  percent of the pre-test value.
- All thermocouples (TCs) used during the test program will be calibrated using three standards (ice water, boiling water, and boiling oil). The TCs will again be checked following the test program and must be within  $\pm 1.5$  percent of the calibrated range.

#### **5.4 DATA REDUCTION PROCEDURES**

The raw data collected during the sampling and analysis procedures will be used to calculate the results of the testing program. The analysis or reduction of the data to the final results will follow these steps, where appropriate to the test method:

1. Check field-sampling data for accuracy and calculate appropriate data averages (e.g., temperatures, pressures, volumes, etc.).
2. Double-check calculation of the data averages.
3. Review in-house and contract laboratory reports and ensure that appropriate and/or required QA/QC steps were followed.
4. Input field and laboratory data to established, verified computer spreadsheets for calculation of volumetric flow rates, mass emission rates or other appropriate results.
5. To verify results, perform example calculations by hand on a single test run for each emission result reported.
6. Compile summary tables of results and review all inputs.

The report will include copies of spreadsheet printouts (data input and results output) and example calculation checks. The field data sheets with average data calculations will also be included. All values found to be below the detection limit of the analytical method will be reported as “less than” (“<”) the full detection limit value.

#### **5.5 REPORT FORMAT**

MAQS will prepare a final report to present the test data, calculations, descriptions and results. The report will include a series of the appendices to present copies of the field data sheets, equipment calibration data, and example calculations. MAQS uses computer



spreadsheets to calculate results from field data sheets and laboratory results. One run of every method performed is also hand calculated. The hand calculations are checked against the spreadsheet results and included in the example calculation appendix of the final report. MAQS understands the “Standard Condition(s)” that are to be used in the BAAQMD are 29.92 inches of mercury and 70 °F.

The report will be divided into various sections describing the different aspects of the source testing program. Table 5-1 presents a typical Table of Contents to be followed during preparation of each final report. Prior to release by MAQS, each report will be reviewed and certified by the project manager and either his supervisor or a peer.



**TABLE 5-1**  
**TYPICAL REPORT FORMAT**  
**LOS MEDANOS ENERGY CENTER**

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**Title Page**  
**Certification of Report**  
**Executive Summary**  
**Table of Contents**

**Section**

- 1.0 Introduction and Summary (includes summary tables of average results)
- 2.0 Source Location Information
  - 2.1 Facility Description
  - 2.2 Sampling Location
  - 2.3 Unit Operating Conditions
- 3.0 Program Description
  - 3.1 Test Program Objectives
  - 3.2 Test Contractor and Key Personnel
  - 3.3 Laboratory Contractors and Analyses
  - 3.4 Test Program Calculations
  - 3.5 Program Test Schedule
- 4.0 Test Procedures
  - 4.1 Method Summaries for Criteria Pollutants
  - 4.2 Method Summaries for Toxic Air Contaminants
  - 4.3 Ancillary Tests
- 5.0 Quality Assurance and Reporting
- 6.0 Discussion of Results (includes summary tables of individual results)

**Appendices**

- A Standard Measurement Procedures
  - B Quality Assurance Program
    - B.1 Program Summary
    - B.2 ARB Certifications
    - B.3 Equipment Calibrations
  - C Process Data
  - D Field Data Sheets
  - E Laboratory Reports
  - F Emission Calculations
  - G Chain of Custody Forms
- 



## 5.6 AVERAGE RESULT SUMMARY

Table 5-2 presents the typical tabular format that will be used to summarize the results in the final source test report. Separate tables will outline the results for each target analyte and compare them to their respective emissions limits.

**TABLE 5-2**  
**TYPICAL RESULT SUMMARY**  
**TEST CONDITION**  
**SPECIES**

Test No.:	1-XX	2-XX	3-XX	Average
<b>Date:</b>	X	X	X	--
<b>Time:</b>	X	X	X	--
<b>Flue Gas:</b>				
O <sub>2</sub> , % volume dry	X	X	X	X
CO <sub>2</sub> , % volume dry	X	X	X	X
Flue gas temperature °F	X	X	X	X
Moisture content, % volume	X	X	X	X
Volumetric flow rate, dscfm	X	X	X	X
<b>Species:</b>				
ppm volume dry	X	X	X	X
ppm @ 15% O <sub>2</sub>	X	X	X	X
lb/hr	X	X	X	X
tons/yr	X	X	X	X
lb/MMBtu	X	X	X	X

## 5.7 EPA PROTOCOL GAS VERIFICATION PROGRAM (PGVP)

MAQS shall use only protocol gas certified by an EPA protocol gas production site and provide Calpine with the following information for each protocol gas used: gas level code, a code for the type of EPA protocol gas used, the PGVP vendor ID issued by EPA for the EPA protocol gas production site that supplied the EPA protocol gas cylinder, the expiration date for the EPA protocol gas cylinder, and the cylinder number.



## **SECTION 6.0**

### **PLANT ENTRY AND SAFETY**

#### **6.1 SAFETY RESPONSIBILITIES**

The plant safety coordinator is responsible for ensuring routine compliance with plant entry, health, and safety requirements. The plant manager has the authority to impose or waive facility restrictions. The MAQS Project Manager (Andrew Berg) has the authority to negotiate any deviations from the facility restrictions with the plant site safety coordinator.

#### **6.2 SAFETY PROGRAM**

MAQS has a comprehensive health and safety program that satisfies Federal OSHA requirements. The program includes an Illness and Injury Prevention Program, site-specific safety meetings and training in safety awareness and procedures. The basic elements include: (1) written policies and procedures; (2) routine training of employees and supervisors; (3) medical monitoring when necessary; (4) use of personal protection equipment; (5) hazard communication; (6) pre-test safety meetings; and (7) routine surveillance of on-going test work.

MAQS will provide all safety-related equipment to its employees. The equipment will include hard hats, safety shoes, safety glasses and goggles, and hearing protection.

#### **6.3 SAFETY REQUIREMENTS**

All test personnel will adhere to the following standard safety measures:

- Attend safety indoctrination session upon initial arrival at the plant and complete the safety checklist.
- Confine selves to the test and administration areas only.
- Wear hard hats at all times on-site where designated.
- Wear protective shoes or boots in test area.
- Wear protective glasses with side shields or goggles in designated areas.
- Know the location of first aid equipment and fire extinguishers.
- Refrain from smoking.



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## **APPENDIX A**

### **STANDARD MEASUREMENT PROCEDURES**



Method:	<b>Continuous Emission Monitoring (CEM) System</b>
Reference:	SCAQMD 100.1, CARB 100, EPA 7E, 3A, 10, 6C
Principle:	Sample gas is drawn from the stack or duct through a sample conditioning system and is sent through a sample manifold to a series of gas analyzers for measurement of the concentrations of O <sub>2</sub> , CO <sub>2</sub> , NO <sub>x</sub> , CO and SO <sub>2</sub> .
Analyzers:	See the description pages for the individual analyzers; those pages follow this description of the sampling system.

The CEM sampling system includes three basic subsystems. These are (1) the sample interface, which includes the probe, connecting tubing, and the sample conditioning and transport system, (2) the gas analyzers and their calibration gases, and (3) the data acquisition system. This section presents a description of the sample interface, the calibration gases, and the data acquisition system. Descriptions of the individual analyzers are provided in following sections.

The sample interface includes components to extract a representative sample from the stack or duct, transport the sample to the analyzers, and remove moisture and particulate material from the sample. The system must also preserve the measured gases and deliver the sample for analysis without significant interference. A diagram of the system is provided in Figure 1. The sample interface system includes the following components.

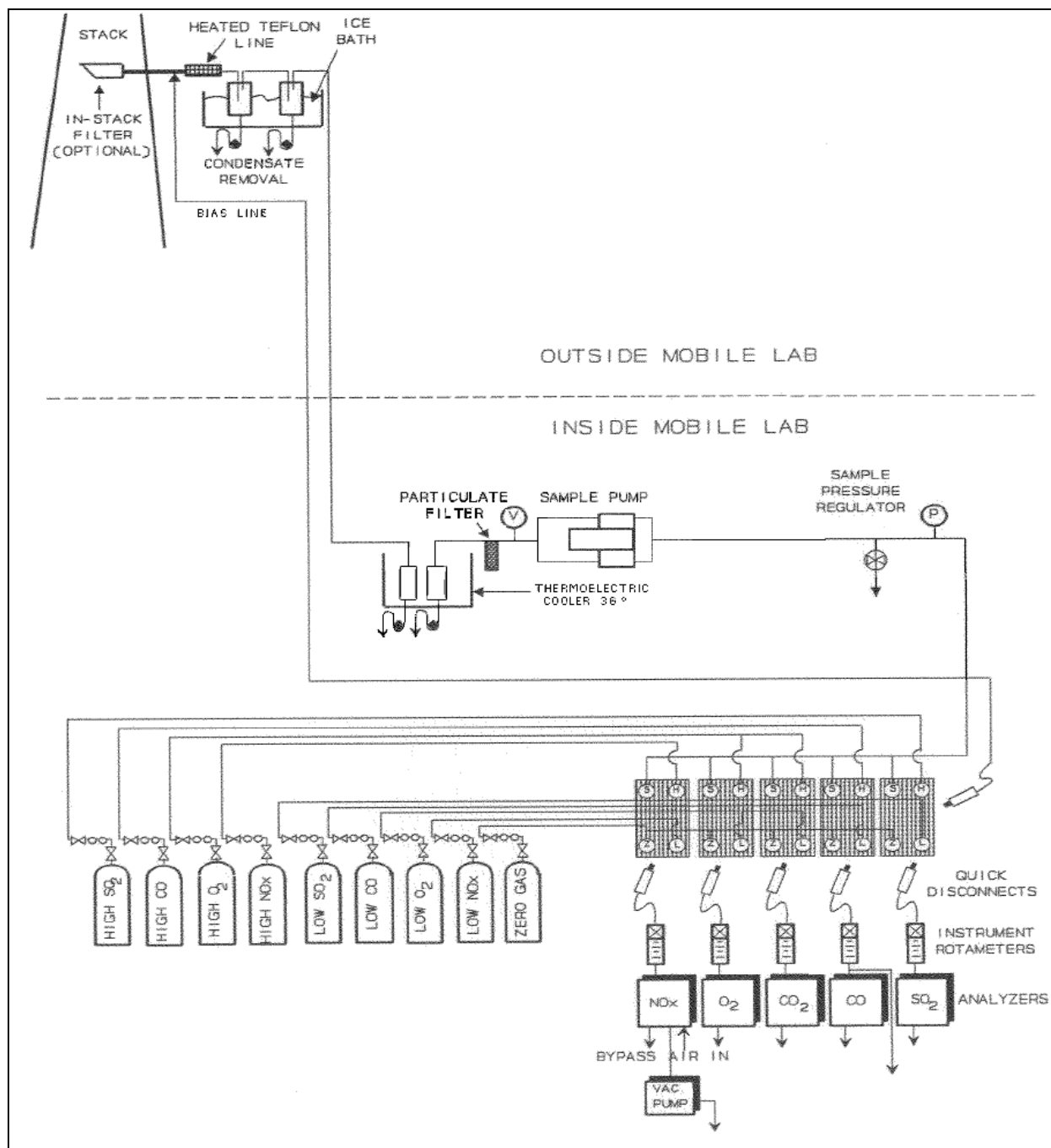
- Probe – the probe is usually heated to prevent condensation of moisture. In some cases the probe may be unheated, depending on the dynamics of the stack environment (i.e. the temperature is high enough to prevent condensation without heating) and the gases to be measured for the testing program. The probe liner or tubing may be constructed of glass, Teflon, titanium or stainless steel, depending on the stack temperature, the matrix of stack gases and the gases to be measured. The probe length is chosen to provide access to the stack traverse points or sampling point required by the testing methods. When used at sources with significant particulate concentrations, the probe may include a filter either at the tip (in-stack) or in a heated box (out-of-stack).
- Heated line – a short section of flexible, heated Teflon tubing is used to connect the probe to the moisture removal system. The line is less than 6 feet in length except in cases where longer tubing is needed to allow traversing of the stack with a long probe (i.e. for stratification tests).
- Moisture conditioning system – the role of the moisture removal system is to cool the sample gas and condense the moisture for removal, yet to minimize the contact between the sample gas and the condensate. Contact between the sample and condensate may cause scrubbing or other interference with the concentration of some gases, especially the water-soluble gases such as SO<sub>2</sub> and NO<sub>2</sub>. The sample must be cooled to 37°F or lower in order to present sufficiently dry sample gas to the analyzers. In most cases, two moisture removal systems are necessary to provide sufficient cooling. The first system includes knockout traps constructed of glass (e.g. “short stem” impingers) or stainless



steel immersed in an ice bath. The second system includes thermoelectrically-cooled knockouts with continuous moisture removal pumps, and sufficient cooling capacity to reduce the sample gas temperature to 37°F or below. The second system may be located at ground level, or on the stack. If the two systems are separated by a connecting line of Teflon tubing, the tubing must be at least 10°F warmer than the temperature of the gas leaving the first conditioner.

- Sample transport – a leak-free diaphragm pump is used to transport sample from the probe and moisture conditioning systems to the analyzers in the mobile lab. The pump may be in the mobile lab as shown in Figure 1, or may be located on the stack platform. In either case, a length of Teflon tubing is used to connect the systems at the sampling location or stack platform to the systems in the mobile lab. The “vacuum side” of the system from the probe to the pump is leak checked before and after the test runs by plugging the tip of the probe and drawing the pump’s maximum vacuum (or at least the maximum vacuum recorded during the test runs) on the system and delivering all the sample through a single rotameter. The leak check passes if the total flow is less than 2% of the flow noted during the test runs (usually this means a leak rate below 0.5 scfh).
- Sample manifold – the pump delivers sample gas to the analyzers through a manifold system in the mobile lab. The manifold system includes valves for directing sample or calibration gases to any or all analyzers, and for controlling the sample pressure and flow rates. Manifold pressure is modulated using a back-pressure regulator.
- Gas analyzers and calibration gases – the individual gas analyzers are described on separate pages that follow this system description. The gases used for calibration of the analyzers are prepared and analyzed by EPA Protocol and are, at a minimum, certified by the manufacturer to be within 1% of the stated concentration. Each gas cylinder is equipped with a pressure regulator to supply the calibration gas to the analyzer at the same pressure and flow rate as the sample gas. The concentrations of the calibration gases are selected for the range of measurement necessary to determine compliance with emission limits. The gas concentrations necessary are provided in the test method, which must be consulted when choosing the gases to be used for a testing program. The direction of zero, span, or sample gas to each analyzer is accomplished by operation of the sample/calibration selector fittings.
- Calibration error and bias checks – calibration error is determined for each analyzer by directing zero gas, high-range and mid-range gases directly through the manifold to the analyzer. Bias checks are conducted before and after each test run by delivering zero and calibration gases in turn to the “tee” fitting at the back of the sampling probe just prior to the connecting Teflon tubing.
- Data acquisition system – the output of the analyzers is continuously recorded by a digital data acquisition system. The digital system, known as MoleDAQ, provides documentation of the range and calibrations for each analyzer, as well as recording of the output of the analyzer during each calibration error test, bias check and test run. The system also calculates the percent error, percent drift, and the test run results corrected for drift. Results can be provided from “on-site” printouts of one-minute average data, or from text computer files of the data. Where required by regulations, a digital or analog strip chart recorder may also be used to “back-up” the digital data.

**Figure 1. CEM System Diagram**



Method:	<b>Oxygen (O<sub>2</sub>) by Continuous Analyzer</b>
Reference:	EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of O <sub>2</sub> concentration.
Analyzer:	California Analytical 100P, 110P, 200, 300, or Teledyne 320A
Measurement Principle:	Paramagnetism
Ranges:	0-5, 0-10, 0-25, 0-100% O <sub>2</sub>
Accuracy:	1% of full scale
Output:	0-10 V, linear
Interferences:	In comparison to oxygen, other gases have such a minor magnetic susceptibility that most of them are insignificant. Exceptions to this are the nitrogen oxides, which are generally present in ppm concentrations so that their contribution to the measurement is insignificant.
Response Time:	90% <2 seconds
Sampling Procedure:	A representative stack gas sample is collected and conditioned using the CEM system described previously. A stratification check traverse is performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	Oxygen is attracted by a magnetic field. This “paramagnetism” is measured in a special cell in which an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument’s electronic circuitry to give an output in percent O <sub>2</sub> by volume.

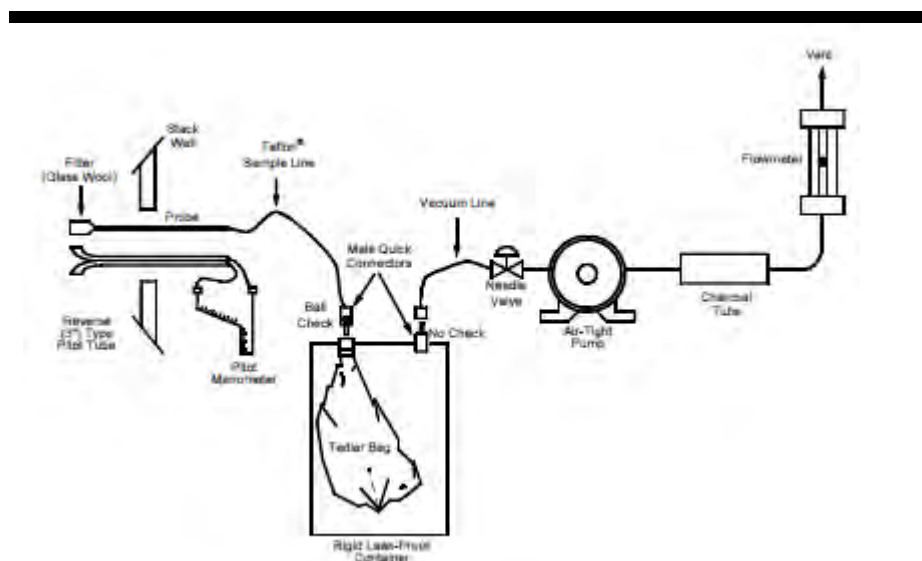
Method:	<b>Carbon Dioxide by (CO<sub>2</sub>) by Continuous Analyzer</b>
Reference:	EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of CO <sub>2</sub> concentration.
Analyzer:	California Analytical 100, 200, 300, or Horiba VIA 510
Measurement Principle:	Non-dispersive infrared (NDIR)
Accuracy:	1% of full scale
Ranges::	0-5 minimum, 0-100 maximum
Output:	0-10 V
Interferences:	A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.
Response Time:	1.2 seconds
Sampling Procedure:	A representative stack gas sample is collected and conditioned using the CEM system described previously.
Analytical Procedure:	Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale as high as 0 to 100% CO <sub>2</sub> .

Method:	<b>Nitrogen Oxides (NO/NO<sub>x</sub>) by Continuous Analyzer</b>
Reference:	EPA 7E, EPA 20, CARB 100, BAAQMD ST-13A, SCAQMD 100.1
Principle:	A sample is continuously drawn from the stack gas stream, conditioned, and conveyed to the instrument for direct readout of NO or NO <sub>x</sub> .
Analyzer:	EcoPhysics CLD 70E, CLD 70S, California Analytical 600 CLD, or Thermo Scientific 42iHL
Measurement Principle:	Chemiluminescence
Ranges:	0-3 ppm minimum to 0-7500 ppm maximum ranges
Output:	0-10 V
Interferences:	Compounds containing nitrogen (other than ammonia) may cause interference.
Response Time:	90%, 1.5 seconds (NO mode) and 1.7 seconds (NO <sub>x</sub> mode)
Sampling Procedure:	A representative stack gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.
Analytical Procedure:	<p>The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. The operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O<sub>3</sub>) to form NO<sub>2</sub> in an excited state. Light emission results when excited NO<sub>2</sub> molecules revert to their ground state. The resulting chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppm volume dry.</p> <p>In the NO<sub>x</sub> mode, the gas is passed through a converter which converts NO<sub>2</sub> to NO for a measurement of total NO<sub>x</sub> concentration. NO<sub>2</sub> can be determined as the difference in readings between the analyzer's NO and NO<sub>x</sub> modes. Use of a molybdenum catalytic converter instead of a stainless steel high-temperature converter eliminates conversion of NH<sub>3</sub> to NO.</p>

Method:	<b>Carbon Monoxide (CO) by NDIR/Gas Filter Correlation</b>
Reference:	EPA 10, CARB 100, BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TEI Model 48, 48C, or Teledyne 300EM
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1% ppm
Ranges:	0-1 ppm minimum to 0-5,000 ppm maximum
Output:	0-10 V
Interferences:	Negligible interference from water and CO <sub>2</sub>
Rise/Fall Times (0-95%):	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative stack gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N <sub>2</sub> due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector. The detector outputs from the two gas filters are correlated by a microprocessor for analysis of the CO concentration.

Method:	<b>Determination of Volatile Organic Compounds (VOCs) by EPA Compendium Method TO-12 or TO-15</b>
Reference:	EPA Compendium Method TO-12 or TO-15
Principle:	An evacuated canister is filled with flue gas at a constant rate. The tank contents are analyzed for VOCs by preconcentration and gas chromatography (TO-12) or by gas chromatography/mass spectrometry (TO-15).
Sampling Procedure:	A sample is collected at the source (usually from a stack or vent) into a canister evacuated to 0.05 mm Hg. When the canister is opened to the source containing the VOCs to be sampled, the differential pressure causes the sample to flow into the canister. The flow rate is regulated so that it is constant and the period sampled is one hour if possible. Pitot and temperature measurements of the total stack or vent flow are made.
Analytical Procedure:	<p>The canister is shipped immediately after sampling to the laboratory for analysis. For TO-12 analysis, a portion of the gaseous sample is drawn from the canister through a cryogenic trap. The sample is thermally desorbed from the trap and analyzed by GC/FID for low concentrations of organic compounds.</p> <p>For TO-15 analysis, a portion of the gaseous sample from the canister is drawn through a multisorbent packing. Next, the sample is thermally desorbed from the packing and backflushed from the trap onto a gas chromatographic column to separate the compounds. Compounds of interest are determined by mass spectrometry.</p> <p>The Avogadro Group, LLC subcontracts TO-12 and TO-15 analysis to qualified local laboratories experienced in the analytical procedures. These laboratories also supply the canisters for sampling.</p>

Method:	<b>Volatile Organic Compounds (VOC) by EPA Method 18</b>
Reference:	EPA Method 18
Principle:	A Tedlar bag is filled with sample gas at a constant rate. The bag contents are analyzed by gas chromatography–flame ionization detector for concentrations of C <sub>1</sub> through C <sub>6</sub> + hydrocarbons.
Sampling Procedure:	A sample is drawn through a probe of Teflon, glass, titanium or stainless steel tubing and through a length of flexible Teflon tubing directly into a Tedlar bag. The displacement or “lung” sampler is shown in the figure. A pump is used to draw or displace air out of the rigid container so that the bag fills with sample.



Apparatus for sampling of stack gas into a Tedlar bag

Analytical Procedure:	The bag samples are transported to the laboratory for analysis using a gas chromatograph with a flame ionization detector (GC-FID). The GC-FID is calibrated with certified standard gases containing C <sub>1</sub> through C <sub>6</sub> hydrocarbons. The analysis includes column separation of the C <sub>1</sub> through C <sub>6</sub> compounds, and column backflush for the total compounds >C <sub>6</sub> . The laboratory results are reported as ppm volume of methane, ethane, ethene, C <sub>3</sub> , C <sub>4</sub> , C <sub>5</sub> , C <sub>6</sub> and >C <sub>6</sub> hydrocarbons as their methane equivalents.
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Method:	<b>Stack Gas Volumetric Flow Rate by Fuel "F" Factor and Heat Input</b>
Reference:	EPA Method 19
Principle:	The average stack gas volumetric flow rate is determined from the measurement of the heat input rate, stack concentration of O <sub>2</sub> or CO <sub>2</sub> , and either an assigned F Factor or a site specific F Factor as determined from a corresponding fuel analysis.
Measurement Procedure:	The metered fuel flow is recorded over the test period and a fuel flow rate is determined in either scf/hr or lb/hr. The average stack diluent concentration of either O <sub>2</sub> or CO <sub>2</sub> is also determined for the test period using EPA Method 3 or 3A. Finally, the use of an assigned F Factor for a given fuel type as provided in Method 19 can be used with the above parameters to calculate stoichiometrically the stack gas volumetric flow rate. Otherwise, a fuel sample may be collected and analyzed for higher heating value (HHV) and composition (CHONS) and a site specific F Factor determined.
Stoichiometric Calculations:	The stack gas volumetric flow rate is determined from the following set of equations:

Input Parameters:

$Q_f$  = Fuel Flow, scfh (lb/hr)

HHV = Higher Heating Value, Btu/scf (Btu/lb)

O<sub>2</sub> = Exhaust Gas Concentration, %

CO<sub>2</sub> = Exhaust Gas Concentration, %

$F_d$  = F Factor (O<sub>2</sub> Based), dscf/MMBtu

$F_c$  = F Factor (CO<sub>2</sub> Based), dscf/MMBtu

Equations:

$$Q_{sd} = Q_f \times HHV \times F_d \left( \frac{MMBtu}{10^6 \times Btu} \right) \left( \frac{20.9}{20.9 - O_2} \right)$$

or

$$Q_{sd} = Q_f \times HHV \times F_c \left( \frac{MMBtu}{10^6 \times Btu} \right) \left( \frac{100}{CO_2} \right)$$

## Particulate Matter (PM) Emissions

**Method:** EPA 5, Amended February 2000; EPA 202, Amended December 2010

**Deviations:** None

**Alternatives:** A field train proof blank was collected on-site instead of baking the glassware for 6 hours  
Pressurized nitrogen purge was used

**Tester:** The Avogadro Group, LLC

**Lab:** The Avogadro Group, LLC

**Contact:** Robert Odell (925) 680-4357, fax (925) 680-4416

**Analysis:** Gravimetric analysis performed by Avogadro

***Test Description:*** The emissions of total particulate matter (PM) were measured using the procedures and equipment specified in EPA Methods 5 and 202 in conjunction with EPA Methods 1-4. These methods consist of the sampling and analytical methodology necessary to quantify filterable and condensable particulate matter from stationary sources. The quality assurance procedures detailed in the methods were followed.

The sampling was performed isokinetically with a full traverse of the sampling plane. Traverse points were chosen and located according to EPA Method 1.

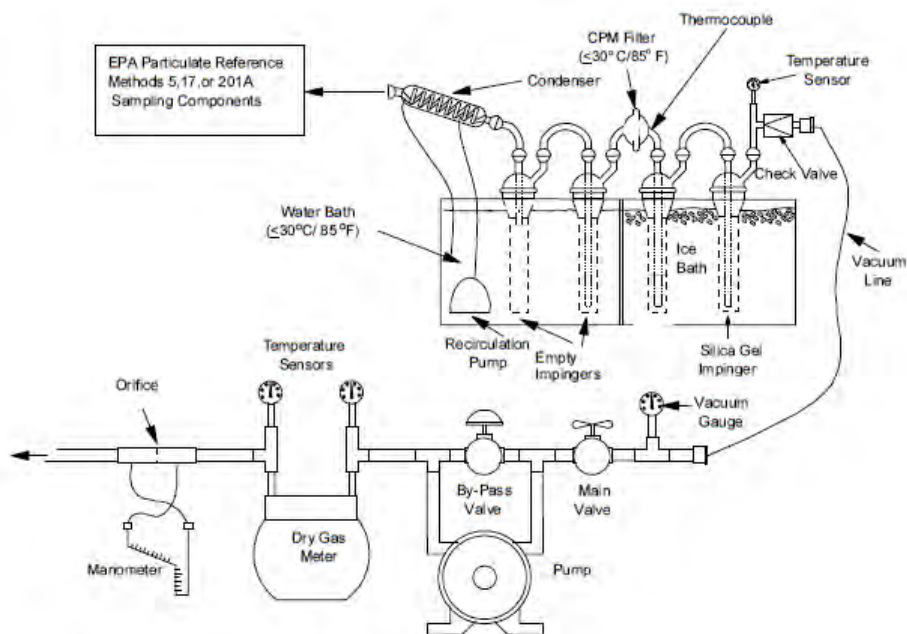


Figure 1. Schematic of Condensable Particulate Sampling Train

*Sampling Train Setup:* The sampling system included a Method 5 nozzle, probe, and heated filter for collection of filterable particulate matter. Sample flowed through the Method 5 apparatus and then through a probe extension of heated Teflon tubing into the Method 202 impinger train. Sample was drawn through the entire system by a leak-free pump and into a calibrated dry gas meter to measure the total sample volume.

The sampling apparatus for filterable particulate matter therefore included a Method 5 nozzle, a heated probe equipped with an S-type pitot tube and thermocouple. The glass or stainless steel nozzle was connected to the heated probe liner of glass or titanium or stainless steel tubing. The probe was attached to an oven containing a heated filter holder containing a glass-fiber filter on a Teflon support disc. The probe temperature and oven were maintained at  $248^{\circ}\text{F} \pm 25^{\circ}\text{F}$  during sampling.

The sampling apparatus for condensable particulate matter (CPM) included the back half of the filter holder, which was connected by a probe extension of heated Teflon tubing to a condenser, an empty condensate dropout impinger (short stem), an empty modified Greenburg Smith impinger and a CPM filter holder. A Teflon membrane filter was loaded into the CPM filter holder. The dropout and impinger were immersed in a water bath, and water was circulated through the condenser, so that the temperature of the sample gas at the CPM filter outlet was maintained between 65 and 85°F (30°C).

The sampling apparatus included a second “cold” section for complete collection of moisture from the sample gas. The CPM filter was followed by two modified Greenburg Smith impingers (the first containing 100 ml of water, and the second containing silica gel) immersed in an ice bath and maintained at or below 68°F (20°C). The impinger train was connected by flexible tubing to the control box, which contained the sampling pump, calibrated dry gas meter, and ancillary temperature and pressure controllers and meters.

*Sampling Train Preparation:* All glassware parts used to collect and analyze samples were cleaned prior to the test with soap and water, followed by rinses with hot tap water, deionized water, acetone, and hexane, in that order. The impinger trains were assembled in the Avogadro laboratory, and transported to the test site for collection of blanks, final set-up for sampling, etc.

*Blanks:* A field train proof blank was collected while on-site prior to conducting the first emissions test. The probe extension, condenser, dropout and impinger, connecting glassware, and front half of the CPM filter housing were rinsed twice with water and collected into a clean glass sample container. The water rinses were followed by a single acetone rinse and two hexane rinses of all corresponding glassware, collected into a separate glass sample container. The liquid levels were marked on each sample container.

Following recovery of the first test run, field reagent blanks of 200 mL each were collected directly from the corresponding wash bottles for acetone, water, and hexane and analyzed as described in *Sample Analysis*.

A field train recovery blank was recovered (one per source type at the facility) following the sample recovery from the first or second test run performed. A CPM sampling train was assembled per the *Sampling Train Setup* description, and then purged with nitrogen (with 100 mL of water added to the first impinger) as described in *Sampling Train Operation*. The recovery blank sample was then recovered as described in *Sample Recovery* and analyzed per the description in *Sample Analysis*.

*Sampling Train Operation*: The sampling train was leak tested once prior to sampling and once following testing. The pre-test leak check was performed at a nominal vacuum to ensure that leakage does not exceed 0.02 cfm. The post-test leak check was performed at a vacuum greater than the highest vacuum recorded during the test to ensure that leakage did not exceed the lesser of a) 4 percent of the average sampling rate, or b) 0.02 cfm. During sampling, the CPM filter was maintained between 65°F and 85°F (20°C and 30°C) while the exit of the silica gel was maintained at or below 68°F (20°C). The sampling rate and nozzle size were chosen to allow isokinetic sampling at 100% ±10%.

Following sampling and the final leak check, the impinger train was moved to the field laboratory, and the impingers were each weighed to determine the mass of moisture collected. The contents of the condenser and dropout were quantitatively transferred with degassed water rinses to the second impinger, and more degassed, deionized ultra-filtered water was added (if necessary) until the tip of the impinger stem was 1 centimeter below the surface of the water. The front section of the impinger train (condenser to CPM filter) was then reassembled and purged with nitrogen through an inline filter at a rate of 14 L/min for 60 minutes. The temperature at the outlet of the CPM filter was maintained between 65 and 85°F during the nitrogen purge.

*Sample Recovery*: The “front-half” or filterable PM was recovered from the sampling apparatus as described in Method 5. The sample fractions included (1) the acetone rinses of the nozzle, probe liner, and the front-half of the filter holder, and (2) the filter. The acetone rinses were stored in a glass sample container and the liquid level was marked. The filter was placed back into its original Petri dish and sealed.

The “back-half” or condensable PM was recovered from the apparatus as described in Method 202. The sample fractions included (1) aqueous rinses (two rinses with water) of the back-half of the filterable filter holder, probe extension, condenser, impingers, connecting glassware, and the front half of the CPM filter holder, (2) organic rinses (one with acetone and two with hexane) of the same parts, and (3) the CPM filter. The filter was removed from the filter holder and placed into a Petri dish. The liquid levels were marked on each sample container. The third and fourth impingers (cold impinger and silica gel impinger) were also weighed and recorded but not collected as sample. Samples remained upright and were maintained below 85°F (30°C) during transport from the job site to the analytical laboratory.

*Sample Analysis*: Analyses were performed in Avogadro’s in-house laboratory. All liquid sample fractions were measured either volumetrically to ± 1 mL or gravimetrically to ± 0.5 g.

The filterable sample fractions were reduced to dryness and desiccated to a constant weight as described in Method 5.

The CPM filter was extracted with water and with hexane in a sonicator as described in Method 202. The extractions were added to the aqueous and organic rinse containers.

The aqueous back-half sample was extracted three times with 30 mL of hexane in a separatory funnel. The combined hexane extracts were added to the organic rinses from the sampling train recovery, in a clean glass beaker, and evaporated at room temperature down to 10 mL. The organic contents were quantitatively transferred to a clean pre-tared weighing tin, evaporated at room temperature to dryness, and placed into the desiccator.

Following the extraction, the aqueous fraction was transferred to a 500 mL clean glass beaker and evaporated down to 10 mL on a hot plate or in an oven at 221°F (105°C) then allowed to dry at room temperature prior to being placed into the desiccator.

All sample fractions were desiccated for 24 hours in a desiccator containing anhydrous calcium sulfate and weighed at intervals of at least 6 hours to a constant weight following desiccation. The laboratory room temperature was maintained at or below 85°C (30°C) at all times.

If a constant weight was not achieved for the aqueous fraction then the residue was re-hydrated in 100 ml of water, titrated to neutral pH, and dried and reweighed as described in Sections 11.2.2.2 to 11. 2.2.4 of Method 202.

**Reporting:** The results for each sample fraction are reported to the nearest 0.1 mg. The results were blank-corrected as described in the methods and presented separately as filterable particulate matter, condensable particulate matter and together as total particulate matter.

## **APPENDIX B**

### **QUALITY ASSURANCE**



## **Appendix B.1**

### **Quality Assurance Program Summary**



## QUALITY ASSURANCE PROGRAM SUMMARY AND CERTIFICATIONS

The Avogadro Group, LLC (Avogadro) ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by internal QA personnel and encompasses seven major areas:

1. Development and use of an internal QA manual.
2. QA reviews of reports, laboratory work, and field testing.
3. Equipment calibration and maintenance.
4. Chain of custody.
5. Continuous training.
6. Knowledge of current test methods.
7. Agency certification.
8. Uncertainty of results.

Each of these areas is discussed individually below.

**Quality Assurance Manual.** Avogadro has prepared a QA Manual according to EPA guidelines and ASTM D-7036. The manual serves to document and formalize all of Avogadro's QA efforts. The manual is constantly updated, and each employee involved in technical services for emission measurements is required to read, understand its contents, and sign a statement that all work they perform will conform to its practices. The manual includes details on the other six QA areas discussed below.

**QA Reviews.** Avogadro's review procedure includes review of each source test report by the QA Manager or equivalent position including data input, calculations and averages, and report text. The Laboratory manager or equivalent reviews all laboratory work, and the Qualified Individual on-site reviews all field work and data sheets.

The most important review is the one that takes place before a test program begins. The QA Manager works with testing personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of any interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

**Equipment Calibration and Maintenance.** The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined below. The schedules for maintenance and calibrations are given in Tables B-1 and B-2.



Quality control checks are also conducted in the field for each test program. A partial list of checks made as part of each CEM system test series is included below as an example of the field QA procedures.

- Sample acquisition and conditioning system leak check.
- 3-point analyzer calibrations (all analyzers).
- Complete system calibration check ("dynamic calibration" through entire sample system).
- Periodic analyzer calibration checks are conducted at the start and end of each test run. Any change between pre- and post-test readings are recorded.
- All calibrations are conducted using EPA Protocol gases certified by the manufacturer.
- Calibration and CEM performance data are fully documented, and are included in each source test report.

**Chain of Custody.** AG maintains full chain of custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, AG documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.).

Samples are stored in a locked area to which only laboratory personnel have access. Neither other AG employees nor cleaning crews have keys to this area.

**Training.** Personnel training is essential to ensure quality testing. AG has formal and informal training programs which may include some or all of the following:

1. Attendance at EPA-sponsored training courses.
2. Enrollment in EPA correspondence courses.
3. A requirement for all technicians to read, understand, and sign AG's QA Manual.
4. In-house training and QA meetings on a regular basis.
5. Maintenance of training records.
6. Administration of internal qualified individual (QI) tests for all methods performed
7. Participation in the Qualified Source Testing Individual (QSTI) program administered by the Source Evaluation Society (SES)

**Knowledge of Current Test Methods.** With the constant updating of standard test methods and the wide variety of emerging test methods, it is essential that any qualified source tester keep abreast of new developments. AG subscribes to services which provide updates on EPA and CARB reference methods, and on EPA, CARB and local District rules and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences.

**Agency Certification.** AG is certified by the CARB as an independent source test contractor for gaseous and particulate measurements. AG also participates in the TNI

Stationary Source Audit Sample (SSAS) audit program for all methods for which audit samples are available.

**Uncertainty of Results.** Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Avogadro personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, Avogadro personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04.

The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report.

**TABLE B-1**  
**SAMPLING INSTRUMENTS AND**  
**EQUIPMENT CALIBRATION SCHEDULE**

Instrument Type	Frequency of Calibration	Standard of Comparison or Method of Calibration	Acceptance Limits
Orifice Meter(large)	12 months	Calibrated dry test meter	± 2% of volume measured
Dry Gas Meter	6 months or when repaired	Calibrated dry test meter	± 2% of volume measured
S-Type Pitot (for use with EPA-type sampling train)	6 months	EPA Method 2	Cp constant (+5%) over working range; difference between average Cp for each leg must be less than 2%
Vacuum Gauges	12 months	NIST-traceable gauge	≤ 1.0 in Hg difference
Temperature Measurement (thermocouples)	12 months	NBS mercury thermometer or NBS calibrated platinum RTD	±4F for <400F ± 1.5% for >400 F
Temperature Readout Devices	6 months	Thermocouple simulator	± 2% full scale reading
Analytical Balance	12 months (check prior to each use)	NIST-traceable weights	± 0.5 mg of stated weight
Probe Nozzles	12 months	Nozzle diameter check	Range <± 0.10 mm for micrometer three measurements
Continuous Analyzers	Every field day. Depends upon use, frequency and performance	As specified by manufacturers operating manuals, EPA NBS gases and/or reference methods	Satisfy all limits specified in operating specifications

**TABLE B-2**  
**EQUIPMENT MAINTENANCE SCHEDULE**  
**Based on Manufacturer's Specifications and Avogadro's Experience**

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Pumps	1. Absence of leaks 2. Ability to draw manufacturer required vacuum and flow	6 months	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Flow Measuring Device	1. Free mechanical movement 2. Absence of malfunction	6 months	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero, span gas	As required by the manufacturer	As recommended by manufacturer
Mobile Van Sampling Systems	Absence of leaks	Depends on nature of use	1. Change filters 2. Leak check 3. Check for system contamination
Sampling Lines	Sample degradation less than 2%	After each test or test series	Blow filtered air through line until dry

## **Appendix B.2**

### **CARB Test Method Certifications and Accreditation Information**



State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER I-14-036

Independent Contractor Approval Pursuant to  
California Code of Regulations, Title 17, Section 91207

The Avogadro Group, LLC

WHEREAS, the Air Resources Board (ARB), pursuant to California Health and Safety Code, Section 41512, has established the procedures contained in California Code of Regulations, Title 17, Section 91200 and following, to allow the use of independent testers for compliance tests required by ARB;

WHEREAS, it has been determined that The Avogadro Group, LLC meets the requirements of ARB for performing ARB Test Methods 1, 2, 3, 4, 5, 8, 17, 100 (CO, CO<sub>2</sub>, NO<sub>x</sub>, O<sub>2</sub>, SO<sub>2</sub>, THC), Visible Emissions Evaluation (VEE), and U.S. Environmental Protection Agency (U.S. EPA) Test Methods 18, 201A, and 202 pursuant to Cal. Code Regs., Title 17, Section 91200 and following, when the following conditions are met:

1. The Avogadro Group, LLC calibrates its metering system in accordance with Section 5.3 of ARB Test Method 5, and establishes and maintains a log of the calibrations;
2. The Avogadro Group, LLC acquires and uses sulfuric acid in accordance with Section 3.3.5 of ARB Test Method 8;
3. The Avogadro Group, LLC uses a probe constructed in accordance with Section 2.1.3 of ARB Test Method 100;
4. The Avogadro Group, LLC uses noncalculating channels on its data acquisition system or a strip chart in accordance with Section 2.2.8 of ARB Test Method 100;
5. The Avogadro Group, LLC includes the following information on all strip charts and/or emissions data sheets: pollutant of interest, source, analyzer range, date and time, zero offsets, and the name(s) of the person(s) operating the instruments;
6. The Avogadro Group, LLC handles condensate in the sample bag while collecting the sample in accordance with Section 8.2.1.4 of U.S. EPA Test Method 18;
7. The Avogadro Group, LLC calibrates and repairs the nozzles it uses for U.S. EPA Test Method 201A in accordance with Section 10.1 of U.S. EPA Test Method 5, and establishes and maintains a log of the calibrations, which shall include notes of the repairs on each nozzle;

8. The Avogadro Group acquires and uses 300 to 500 ml glass beakers as required by Section 6.2.2 (c) of U.S. EPA Test Method 202;
9. The Avogadro Group acquires and uses a 0 to 100 ml glass burette in 0.1 ml graduations as required by Section 6.2.2 (f) of U.S. EPA Test Method 202;
10. The person performing VEE passed ARB Compliance Training Course #100: Fundamentals of Enforcement (FOE)/VEE (Smoke School) and is currently certified to conduct VEE. Any recertification for VEE, following the initial passage of ARB's FOE, must be from a certifying body recognized by ARB at the time VEE is performed; and

WHEREAS, ARB Executive Officer, pursuant to California Health and Safety Code Section 39516, issued Executive Order G-02-008, delegating to the Chief of ARB Monitoring and Laboratory Division (MLD) the authority to approve independent testers in accordance with Cal. Code Regs., Title 17, Section 91200 and following;

NOW, THEREFORE, I, Michael T. Benjamin, Chief of MLD, order that The Avogadro Group, LLC is granted approval from the date of execution of this order until June 30, 2016, to perform the test methods identified above subject to compliance with Cal. Code Regs., Title 17, Section 91200 and following.

BE IT FURTHER ORDERED that during the approved period the Executive Officer or his authorized representative may field audit one or more tests performed pursuant to this order for each test method identified above.

Executed at Sacramento, California this 6th day of August 2014.



Dr. Michael T. Benjamin, Chief  
Monitoring and Laboratory Division



State of California  
**Air Resources Board**  
Approved Independent Contractor

**The Avogadro Group, LLC**

This is to certify that the company listed above has been approved  
by the Air Resources Board to conduct compliance testing  
pursuant to California Code of Regulations, Title 17, Section 91207,  
until June 30, 2016, for those test methods listed below:

**ARB Source Test Methods:**  
1, 2, 3, 4, 5, 8, 17  
100 (CO, CO<sub>2</sub>, NO<sub>x</sub>, O<sub>2</sub>, SO<sub>2</sub>, THC)



Dr. Michael T. Benjamin, Chief  
Monitoring and Laboratory Division

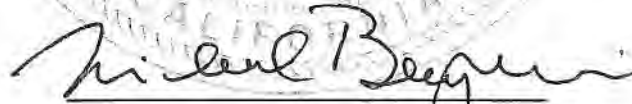


State of California  
**Air Resources Board**  
Approved Independent Contractor

**The Avogadro Group, LLC**

This is to certify that the company listed above has been approved  
by the Air Resources Board to conduct compliance testing  
pursuant to California Code of Regulations, Title 17, Section 91207,  
until June 30, 2016, for those test methods listed below:

**U.S. EPA Test Methods 18, 201A, and 202  
Visible Emissions Evaluation**



Dr. Michael T. Benjamin, Chief  
Monitoring and Laboratory Division



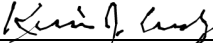

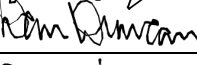
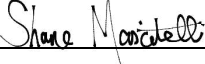
March 25, 2015

To Whom It May Concern,

EPA promulgated minimum competency requirements for firms performing Part 75 emission test programs (Protocol Gas Verification Program and Minimum Competency Requirements for Air Emission Testing, FR 76, No. 59, 17288-17325) on March 28, 2011. The rule, as stated in 40 CFR Part 75, Appendix A, § 6.1.2(a), requires that "On and after March 27, 2012, all relative accuracy test audits (RATAs) of CEMS under this part, and stack testing under §75.19 and Appendix E to this part shall be conducted by an Air Emission Testing Body (AETB) which has provided to the owner or operator of a unit subject to this part the documentation required in paragraph (b) of this section, demonstrating its conformance to ASTM D7036-04 (incorporated by reference, *see* §75.6)."

The rule, as stated in 40 CFR Part 75, Appendix A, § 6.1.2(b), requires that "The owner or operator shall obtain from the AETB a certification that as of the time of testing the AETB is operating in conformance with ASTM D7036-04...The AETB's certification may be limited in scope to the tests identified under paragraph (a). The AETB's certification need not extend to other work it may perform." This letter is written to convey certification of conformance by The Avogadro Group, LLC with those requirements, limited to testing as it pertains to 40 CFR Part 75.

By their signatures below, the Management of The Avogadro Group, LLC, an affiliate of Montrose Air Quality Services, Inc., certify that all relative accuracy testing performed pursuant to 75.74(c)(2)(ii), Section 6.5 of Appendix A or Section 2.3.1 of Appendix B of Part 75, and Stack Testing under 75.19 and Appendix E of Part 75 will be conducted in conformance to ASTM D7036-04 and be overseen and supervised on site by at least one Qualified Individual, as defined in ASTM Standard D7036-04, Section 3.1.15. The performance data collected to indicate conformance with the Standard, as defined in Section 3.1.9 of the Standard, is available to our clients upon request.

Name/Title	Signature	Date
Kevin J. Crosby, VP, Technical		03/27/2015
Wade Latham, Quality Assurance Director		03/27/2015
Dan Duncan, Quality Assurance Manager		04/01/2015
Shane Mascitelli, District Manager		04/02/2015

Implementation Date: 3/25/15  
Revision Number: 0  
Revision Date: NA

# SOURCE EVALUATION SOCIETY



## Qualified Source Testing Individual

LET IT BE KNOWN THAT

**ANDREW M. BERG**

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES  
ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**HAZARDOUS METALS MEASUREMENT SAMPLING METHODS**

ISSUED THIS 27<sup>TH</sup> DAY OF MAY 2014 AND EFFECTIVE UNTIL MAY 26<sup>TH</sup>, 2019

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

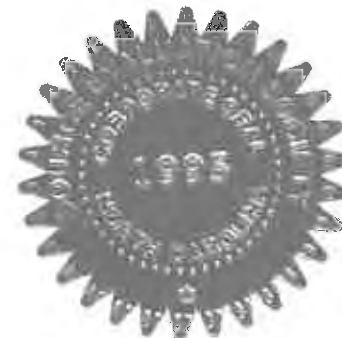
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334



# SOURCE EVALUATION SOCIETY



## Qualified Source Testing Individual

LET IT BE KNOWN THAT

**ANDREW M. BERG**

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES  
ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS**

ISSUED THIS 27<sup>TH</sup> DAY OF MAY 2014 AND EFFECTIVE UNTIL MAY 26<sup>TH</sup>, 2019

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

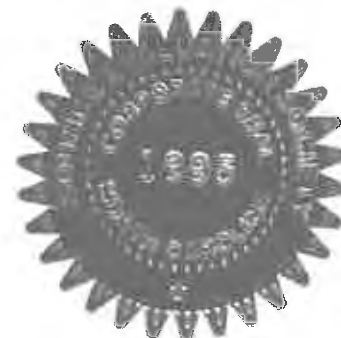
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334



# SOURCE EVALUATION SOCIETY



## Qualified Source Testing Individual

LET IT BE KNOWN THAT

**ANDREW M. BERG**

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES  
ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS**

ISSUED THIS 23<sup>RD</sup> DAY OF JANUARY 2014 AND EFFECTIVE UNTIL JANUARY 22<sup>ND</sup>, 2019

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

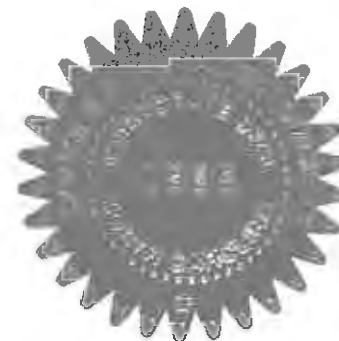
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajlya-Millis, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334



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HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
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ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE  
SAMPLING METHODS**

ISSUED THIS 23<sup>RD</sup> DAY OF JANUARY 2014 AND EFFECTIVE UNTIL JANUARY 22<sup>ND</sup>, 2019

Peter R. Westlip, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

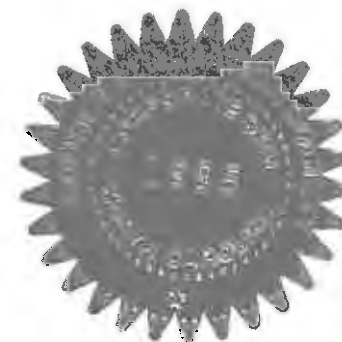
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334





# SOURCE EVALUATION SOCIETY



## Qualified Source Testing Individual

LET IT BE KNOWN THAT

**ANDREW M. BERG**

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES  
ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS**

ISSUED THIS 27<sup>TH</sup> DAY OF MAY 2014 AND EFFECTIVE UNTIL MAY 26<sup>TH</sup>, 2019

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

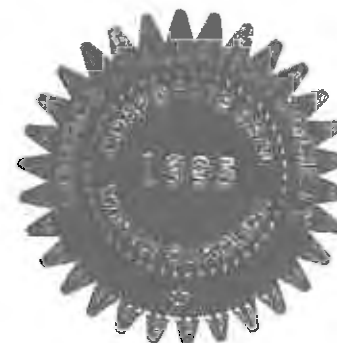
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajlya-Mills, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334



# SOURCE EVALUATION SOCIETY



## Qualified Source Testing Individual

LET IT BE KNOWN THAT

**ANDREW M. BERG**

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED  
EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES  
ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

**HAZARDOUS METALS MEASUREMENT SAMPLING METHODS**

ISSUED THIS 27<sup>TH</sup> DAY OF MAY 2014 AND EFFECTIVE UNTIL MAY 26<sup>TH</sup>, 2019

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

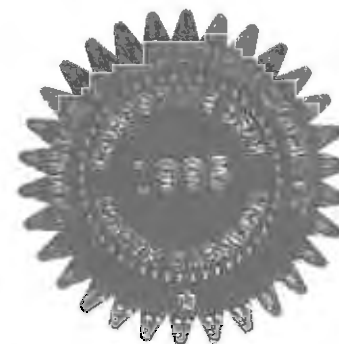
Theresa Lowe, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION  
NO.  
2009-334





## **APPENDIX C**

### **SAMPLING LOCATIONS**



# CALPINE LMEC ~ Aux Boiler M 1

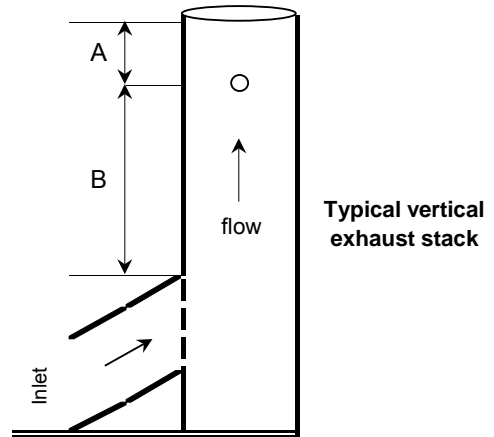
## TRAVERSE POINT LAYOUT (PARTICULATE)

### CIRCULAR STACKS OVER 24 INCHES

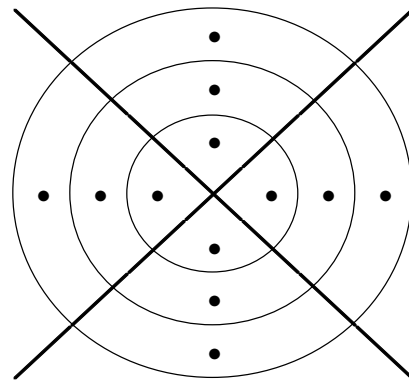
Stack diameter: 72.0 inches  
 Upstream diameter (A): 648.0 inches  
 Downstream diameter (B): 384.0 inches  
 Port length: 6.00 inches  
 Number of ports being used: 2 see note  
 Equivalent upstream diameter (A): 9.000 Pass  
 Equivalent downstream diameter (B): 5.333 Pass  
 All points at least 1.0" from stack wall: 1.872 Pass  
 Total points: 20  
 Points per port: 10

Point	% Diameter	Inside wall Distance (in)	Outside port Distance (in)
1	2.6	1.9	7.9
2	8.2	5.9	11.9
3	14.6	10.5	16.5
4	22.6	16.3	22.3
5	34.2	24.6	30.6
6	65.8	47.4	53.4
7	77.4	55.7	61.7
8	85.4	61.5	67.5
9	91.8	66.1	72.1
10	97.4	70.1	76.1
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A

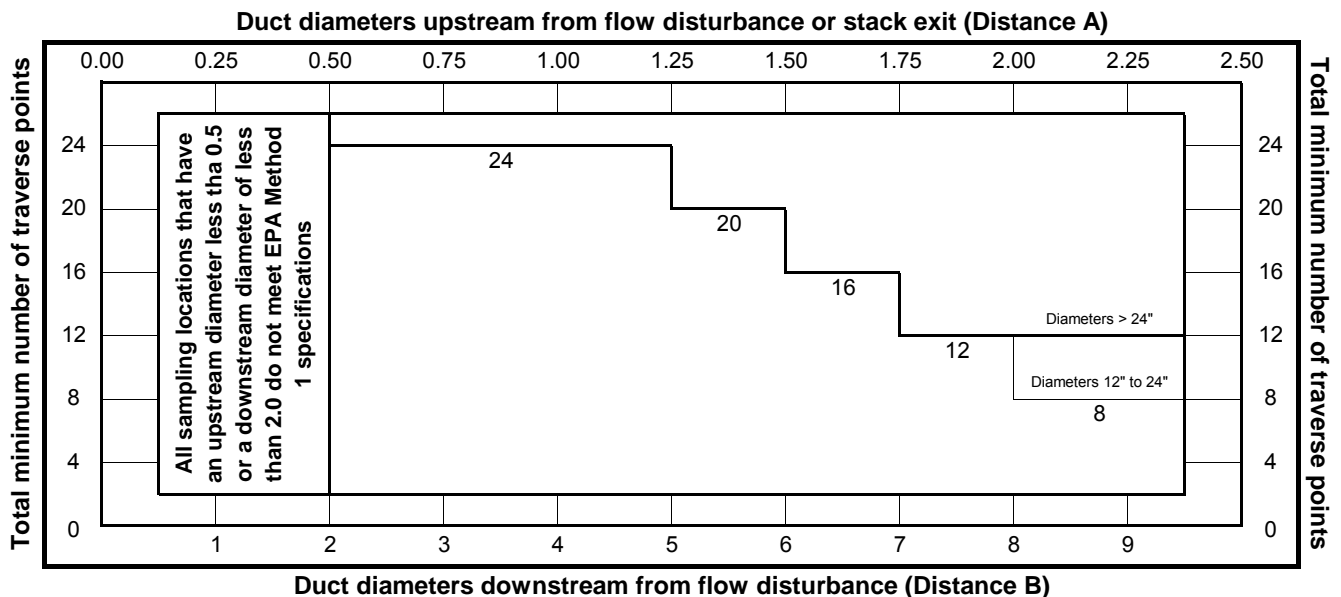
Note: No traverse point shall be within 1.0" of the stack walls (see Sections 11.3.1)



DUCT AREA = 28.274 ft<sup>3</sup>



Example: Location of 12 points

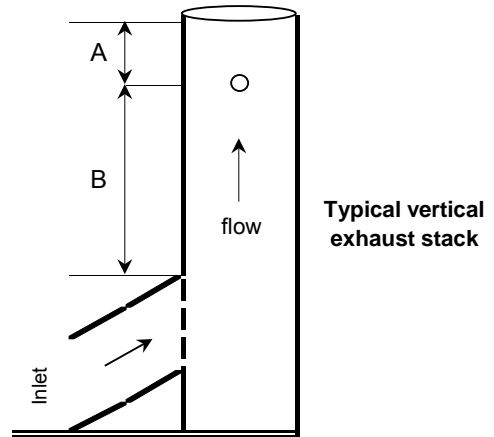


**CALPINE LMEC ~ Turbine/HRSG M 201A**  
**TRAVERSE POINT LAYOUT (PARTICULATE)**  
**CIRCULAR STACKS OVER 24 INCHES**

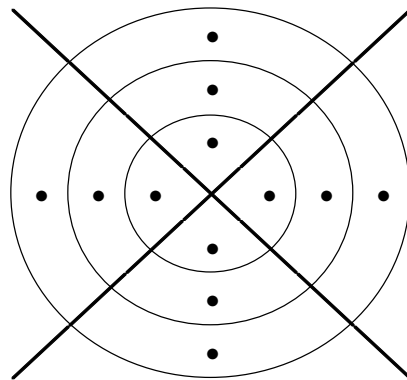
Stack diameter: 234.0 inches  
Upstream diameter (A): 500.0 inches  
Downstream diameter (B): 1900.0 inches  
Port length: 6.00 inches  
Number of ports being used: 2 see note  
Equivalent upstream diameter (A): 2.137 Pass  
Equivalent downstream diameter (B): 8.120 Pass  
All points at least 1.0" from stack wall: 10.296 Pass  
Total points: 12  
Points per port: 6

Point	% Diameter	Inside wall Distance (in)	Outside port Distance (in)
1	4.4	10.3	16.3
2	14.6	34.2	40.2
3	29.6	69.3	75.3
4	70.4	164.7	170.7
5	85.4	199.8	205.8
6	95.6	223.7	229.7
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A
N/A	#N/A	#N/A	#N/A

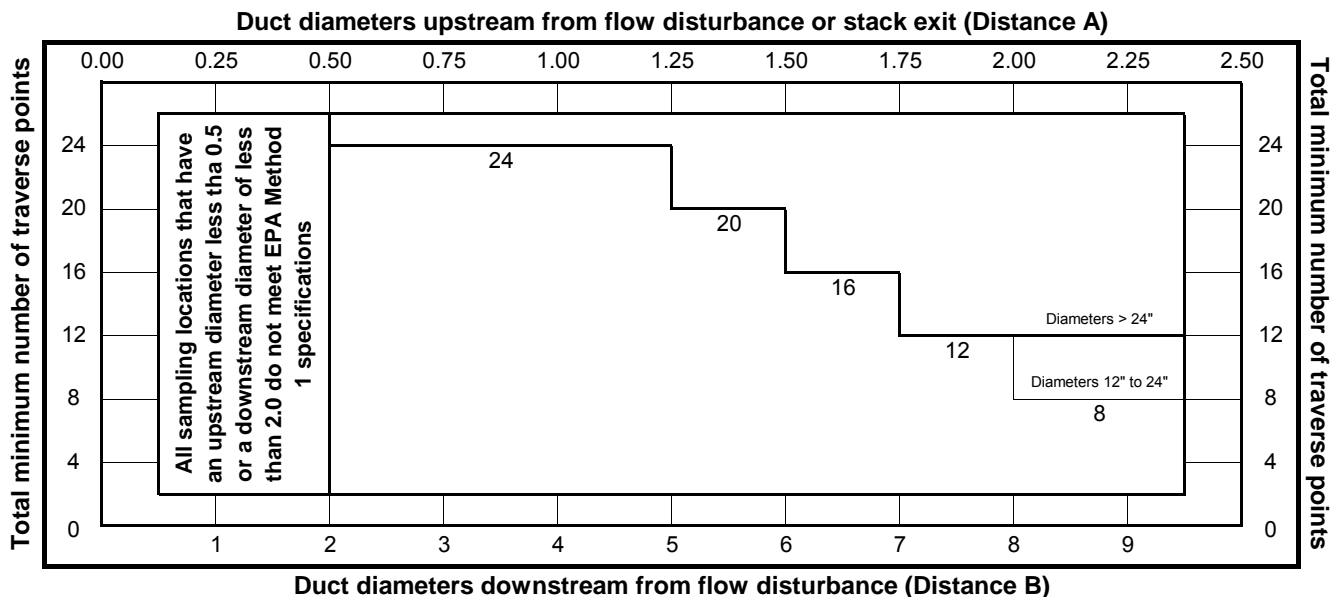
Note: No traverse point shall be within 1.0" of the stack walls (see Sections 11.3.1)



DUCT AREA = 298.648 ft<sup>3</sup>



Example: Location of 12 points



## **APPENDIX D**

### **OPERATING PERMITS**

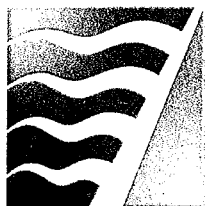


October 26, 2015

RECEIVED

NOV X 2 2015

CALPINE  
DELTA / LOS MEDANOS



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

Maria Barroso  
**Los Medanos Energy Center, LLC**  
P.O. Box 551  
Pittsburg, CA 94565

Application Number: 27473  
Plant Number: B1866  
Equipment Location: 750 East Third Street  
Pittsburg, CA 94565

Dear Ms. Barroso:

This is to advise you that the Bay Area Air Quality Management District is issuing an administrative amendment to the Major Facility Review permit for your facility.

The purpose of this administrative amendment is to:

- Change the facility contact from Jeff Sorenson to Maria Barroso and to delete the alternate responsible officials listed on the current Title V permit. These were added to the permit in error since 40 CFR Part 70 and District Regulation 2, Rule 6 do not have any provisions for an alternate responsible official for Title V.
- Change the alternate designated representative for Acid Rain permitting from Jeff Sorenson to Maria Barroso.
- Update the EPA region 9 mailing address listed in Section I.G. of the permit

Enclosed is a copy of the final permit. If you have any questions regarding this administrative amendment, please call May Leung, Air Quality Permit Technician, at (415) 749-4729 or fax at (415) 749-5030.

Sincerely yours,

Jim Karas, P.E.  
Director of Engineering Division

Enclosure

JK:DTJ:myl

cc: Dale Donmoyer, Los Medanos Energy Center, LLC  
Reginald Littlejohn, Los Medanos Energy Center, LLC

ALAMEDA COUNTY  
Tom Bates  
Margaret Fujioka  
Scott Haggerty  
Nate Miley

CONTRA COSTA COUNTY  
John Gioia  
David Hudson  
Karen Mitchoff  
Mark Ross

MARIN COUNTY  
Katie Rice

NAPA COUNTY  
Brad Wagenknecht

SAN FRANCISCO COUNTY  
John Avalos  
Edwin M. Lee  
Eric Mar  
(Vice-Chair)

SAN MATEO COUNTY  
David J. Canepa  
Carole Groom  
(Chair)

SANTA CLARA COUNTY  
Cindy Chavez  
Liz Kniss  
(Secretary)  
Jan Pepper  
Rod G. Sinks

SOLANO COUNTY  
James Spering

SONOMA COUNTY  
Teresa Barrett  
Shirlee Zane

Jack P. Broadbent  
EXECUTIVE  
OFFICER/APCO

# Bay Area Air Quality Management District

939 Ellis Street  
San Francisco, CA 94109  
(415) 771-6000

---

**Final**

## Major Facility Review Permit

Issued To:

**Los Medanos Energy Center, LLC**  
**Facility #B1866**

**Facility Address:**

750 East Third Street  
Pittsburg, CA 94565

**Mailing Address:**

PO Box 551  
Pittsburg, CA 94565

**Responsible Official:**

Dale Donmoyer  
General Manager  
(925) 252-2096

**Facility Contact:**

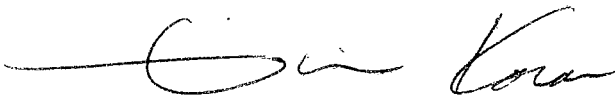
Maria Barroso  
EHS Specialist II  
(925) 529-8286

---

**Type of Facility:** Power Plant  
**Primary SIC:** 4911  
**Product:** Generation of Electricity

**BAAQMD Engineering Division Contact:**  
Brian Lusher

**ISSUED BY THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT**



Jim Karas, P. E., Director of Engineering Division

October 26, 2015

Date

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**IX. TITLE IV ACID RAIN PERMIT**

**Effective October 3, 2011 through October 2, 2016**

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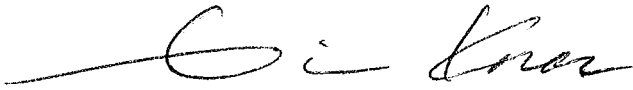
**ISSUED TO:**

Los Medanos Energy Center, LLC  
P. O. Box 551  
Pittsburg, CA 94565

**PLANT SITE LOCATION:**

750 East Third Street  
Pittsburg, CA 94565

**ISSUED BY:**



Jim Karas, P. E., Director of Engineering Division

October 26, 2015

Date

---

**Type of Facility:** Power Plant  
**Primary SIC:** 4911  
**Product:** Electricity

**DESIGNATED REPRESENTATIVE**

**Name:** Dale Donmoyer  
**Title:** General Manager  
**Phone:** (925) 252-2096

**ALTERNATE DESIGNATED REPRESENTATIVE:**

**Name:** Maria Barroso  
**Title:** EHS Specialist II  
**Phone:** (925) 252-8286



# Bay Area Air Quality Management District

939 Ellis Street  
San Francisco, CA 94109  
(415) 771-6000

---

**Final**

## Major Facility Review Permit

Issued To:

**Los Medanos Energy Center, LLC**  
**Facility #B1866**

**Facility Address:**

750 East Third Street  
Pittsburg, CA 94565

**Mailing Address:**

PO Box 551  
Pittsburg, CA 94565

**Responsible Official:**

Dale Donmoyer  
General Manager  
(925) 252-2096

**Facility Contact:**

Maria Barroso  
EHS Specialist II  
(925) 529-8286

---

**Type of Facility:** Power Plant  
**Primary SIC:** 4911  
**Product:** Generation of Electricity

**BAAQMD Engineering Division Contact:**  
Brian Lusher

**ISSUED BY THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT**

Signed by Jim Karas, P.E.  
Jim Karas, P. E., Director of Engineering Division

October 26, 2015  
Date

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## **I. STANDARD CONDITIONS**

### **A. Administrative Requirements**

The permit holder shall comply with all applicable requirements in the following regulations:

BAAQMD Regulation 1 - General Provisions and Definitions

(as amended by the District Board on 7/19/06);

SIP Regulation 1 - General Provisions and Definitions

(as approved by EPA through 6/28/99);

BAAQMD Regulation 2, Rule 1 - Permits, General Requirements

(as amended by the District Board on 7/19/06);

SIP Regulation 2, Rule 1 - Permits, General Requirements

(as approved by EPA through 1/26/99);

BAAQMD Regulation 2, Rule 2 - Permits, New Source Review

(as amended by the District Board on 6/15/05);

SIP Regulation 2, Rule 2 - Permits, New Source Review and Prevention of Significant Deterioration

(as approved by EPA through 1/26/99);

BAAQMD Regulation 2, Rule 4 - Permits, Emissions Banking

(as amended by the District Board on 12/21/04);

SIP Regulation 2, Rule 4 - Permits, Emissions Banking

(as approved by EPA through 1/26/99);

BAAQMD Regulation 2, Rule 5 – New Source Review of Toxic Air Contaminants

(as adopted by the District Board on 6/15/05);

BAAQMD Regulation 2, Rule 6 - Permits, Major Facility Review

(as amended by the District Board on 4/16/03), and

SIP Regulation 2, Rule 6 – Permits, Major Facility Review

(as approved by EPA through 6/23/95).

### **B. Conditions to Implement Regulation 2, Rule 6, Major Facility Review**

1. This Major Facility Review Permit was reissued on October 3, 2011, and expires on October 2, 2016. The permit holder shall submit a complete application for renewal of this Major Facility Review Permit no later than April 2, 2016 and no earlier than October 3, 2015. If a complete application for renewal has not been submitted in accordance with this deadline, the facility may not operate after October 2, 2016. (Regulation 2-6-307, 404.2, & 409.6; MOP Volume II, Part 3, §4.2) If the permit renewal has not been issued by October 2, 2016, but a complete application for renewal has been submitted in accordance with the above deadlines, the existing permit will continue in force until the District takes final action on the renewal application." This is the "application shield" pursuant to BAAQMD Regulation 2-6-407.
2. The permit holder shall comply with all conditions of this permit. The permit consists of this document and all appendices. Any non-compliance with the terms and conditions of this permit will constitute a violation of the law and will be grounds for enforcement action; permit termination, revocation and re-issuance, or modification; or denial of a permit renewal application. (Regulation 2-6-307; MOP Volume II, Part 3, §4.11)

## I. Standard Conditions

3. In the event any enforcement action is brought as a result of a violation of any term or condition of this permit, the fact that it would have been necessary for the permittee to halt or reduce the permitted activity in order to maintain compliance with such term or condition shall not be a defense to such enforcement action. (MOP Volume II, Part 3, §4.11)
4. This permit may be modified, revoked, reopened and reissued, or terminated for cause. (Regulation 2-6-307, 409.8, 415; MOP Volume II, Part 3, §4.11)
5. The filing of a request by the facility for a permit modification, revocation and re-issuance, or termination, or the filing of a notification of planned changes or anticipated non-compliance does not stay the applicability of any permit condition. (Regulation 2-6-409.7; MOP Volume II, Part 3, §4.11)
6. This permit does not convey any property rights of any sort, or any exclusive privilege. (Regulation 2-6-409.7; MOP Volume II, Part 3, §4.11)
7. The permit holder shall supply within 30 days any information that the District requests in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. (Regulation 1-441, Regulation 2-6-409.4 & 501; MOP Volume II, Part 3, §4.11)
8. Any records required to be maintained pursuant to this permit that the permittee considers proprietary or trade secret information shall be prominently designated as such. Copies of any such proprietary or trade secret information which are provided to the District shall be maintained by the District in a locked confidential file, provided, however, that requests from the public for the review of any such information shall be handled in accordance with the District's procedures set forth in Section 11 of the District's Administrative Code. (Regulation 2-6-419; MOP Volume II, Part 3, §4.11)
9. Proprietary or trade secret information provided to EPA will be subject to the requirements of 40 CFR Part 2, Subpart B - Public Information, Confidentiality of Business Information. (40 CFR Part 2)
10. The emissions inventory submitted with the application for this Major Facility Review Permit is an estimate of actual emissions or the potential to emit for the time period stated and is included only as one means of determining applicable requirements for emission sources. It does not establish, or constitute a basis for establishing, any new emission limitations. (MOP Volume II, Part 3, §4.11)
11. The responsible official shall certify all documents submitted by the facility pursuant to the major facility review permit. The certification shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. The certifications shall be signed by a responsible official for the facility. (MOP Volume II, Part 3, §4.11)
12. The permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors. (Regulation 2-6-307).

## **I. Standard Conditions**

### **C. Requirement to Pay Fees**

The permit holder shall pay annual fees in accordance with District Regulation 3, including Schedule P. (Regulation 2-6-402 & 409.13, Regulation 3; MOP Volume II, Part 3, §4.12)

### **D. Inspection and Entry**

**Access to Facility:** The permit holder shall provide reasonable access to the facility and equipment that is subject to this permit to the APCO and/or to his or her designee. (Regulation 1-440, Regulation 2-6-409.3; MOP Volume II, Part 3, §4.14)

### **E. Records**

1. The permit holder must provide any information, records, and reports requested or specified by the APCO. (Regulation 1-441, Regulation 2-6-409.4)
2. Notwithstanding the specific wording in any requirement, all records for federally enforceable requirements shall be maintained for at least five years from the date of creation of the record. (Regulation 2-6-501, Regulation 3; MOP Volume II, Part 3, §4.7)

### **F. Monitoring Reports**

Reports of all required monitoring must be submitted to the District at least once every six months, except where an applicable requirement specifies more frequent reporting. Reports shall be for the following periods: April 1st through September 30th and October 1st through March 31st, and are due on the last day of the month after the end of the reporting period. All instances of non-compliance shall be clearly identified in these reports. The reports shall be certified by the responsible official as true, accurate, and complete. In addition, all instances of non-compliance with the permit shall be reported in writing to the District's Compliance and Enforcement Division within 10 calendar days of the discovery of the incident. Within 30 calendar days of the discovery of any incident of non-compliance, the facility shall submit a written report including the probable cause of non-compliance and any corrective or preventative actions. The reports shall be sent to the following address:

Director of Compliance and Enforcement  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, CA 94109  
Attn: Title V Reports

(Regulation 2-6-502, Regulation 3; MOP Volume II, Part 3, §4.7)

### **G. Compliance Certification**

Compliance certifications shall be submitted annually by the responsible official of this facility to the Bay Area Air Quality Management District and to the Environmental Protection Agency. The certification period will be September 1st to August 31st. The certification shall be submitted by September 30th of each year. The certification must

## **I. Standard Conditions**

list each applicable requirement, the compliance status, whether compliance was continuous or intermittent, the method used to determine compliance, and any other specific information required by the permit. The permit holder may satisfy this requirement through submittal of District-generated Compliance Certification forms. The certification should be directed to the District's Compliance and Enforcement Division at the address above, and a copy of the certification shall be sent to the Environmental Protection Agency at the following address:

Director  
Air Division, Permits Office (AIR-3)  
USEPA, Region IX  
75 Hawthorne Street  
San Francisco, CA 94105

(MOP Volume II, Part 3, §4.5 and 4.15)

### **H. Emergency Provisions**

1. The permit holder may seek relief from enforcement action in the event of a breakdown, as defined by Regulation 1-208 of the District's Rules and Regulations, by following the procedures contained in Regulations 1-431 and 1-432. The District will thereafter determine whether breakdown relief will be granted in accordance with Regulation 1-433. (MOP Volume II, Part 3, §4.8)
2. The permit holder may seek relief from enforcement action for a violation of any of the terms and conditions of this permit by applying to the District's Hearing Board for a variance pursuant to Health and Safety Code Section 42350. The Hearing Board will determine after notice and hearing whether variance relief should be granted in accordance with the procedures and standards set forth in Health and Safety Code Section 42350 et seq. (MOP Volume II, Part 3, §4.8)
3. The granting by the District of breakdown relief or the issuance by the Hearing Board of a variance will not provide relief from federal enforcement. (MOP Volume II, Part 3, §4.8)

### **I. Severability**

In the event that any provision of this permit is invalidated by a court or tribunal of competent jurisdiction, or by the Administrator of the EPA, all remaining portions of the permit shall remain in full force and effect. (Regulation 2-6-409.5; MOP Volume II, Part 3, §4.10)

### **J. Miscellaneous Conditions**

The maximum capacity for each source as shown in Table II-A is the maximum allowable capacity. Exceedance of the maximum allowable capacity for any source is a violation of Regulation 2, Rule 1, Section 301. (Regulation 2-1-301)

## **I. Standard Conditions**

### **K. Accidental Release**

This facility is subject to 40 CFR Part 68, Chemical Accident Prevention Provisions. The permit holder shall submit a risk management plan (RMP) by the date specified in §68.10. The permit holder shall also certify compliance with the requirements of Part 68 as part of the annual compliance certification, as required by Regulation 2, Rule 6. (40 CFR Part 68, Regulation 2, Rule 6)

### **L. Conditions to Implement Regulation 2, Rule 7, Acid Rain**

1. Every year starting January 30, 2000, the permit holder shall hold one sulfur dioxide allowance on March 1 (February 29<sup>th</sup> during a leap year) for each ton of sulfur dioxide emitted during the preceding year from January 1 through December 31. (MOP Volume II, Part 3, §4.9)
2. The equipment installed for the continuous monitoring of O<sub>2</sub> and NO<sub>x</sub> shall be maintained and operated in accordance with 40 CFR Parts 72 and 75. (Regulation 2-7, Acid Rain)
3. A written Quality Assurance program must be established in accordance with 40 CFR Part 75, Appendix B for NO<sub>x</sub> which includes, but is not limited to: procedures for daily calibration testing, quarterly linearity testing, record keeping and reporting implementation, and relative accuracy testing. (Regulation 2-7, Acid Rain)
4. The permit holder shall monitor SO<sub>2</sub> emissions in accordance with 40 CFR Part 72 and 75. (Regulation 2-7, Acid Rain)
5. The permit holder shall submit quarterly Electronic Data Reports (EDRs) to EPA for S-1 and S-3, Turbines, and S-2 and S-4, Heat Recovery Steam Generators. These reports must be submitted within 30 days following the end of each calendar quarter and shall include all information required in § 75.64. (40 CFR Part 75)

## II. EQUIPMENT

**Table II A – Permitted Sources**

Each of the following sources has been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-301.

S-#	Description	Make or Type	Model	Capacity
1	Gas Turbine (natural gas), 190 MW nominal	General Electric	Frame 7FA Model PG 7241	1,929 MM BTU/hr (HHV)
2	Heat Recovery Steam Generator (natural gas), 90 MW nominal			333 MM BTU/hr (HHV)
3	Gas Turbine (natural gas), 190 MW nominal	General Electric	Frame 7FA Model PG 7241	1,929 MM BTU/hr (HHV)
4	Heat Recovery Steam Generator (natural gas), 90 MW nominal			333 MM BTU/hr (HHV)
5	Auxiliary Boiler (natural gas)	Nebraska	N25-8/5- 126	320 MM BTU/hr (HHV) 3-hour rolling average (provides backup steam only, not used to generate electricity)
6	Diesel Fire Pump Engine	Cummins	6CFA8.2- F3	300 bhp 2.1 MMBTU/hr (HHV) 504.5 cubic inch displacement
7	Natural-Gas Fired Emergency Generator	Waukesha, Turbocharged, Intercooled, Lean-Burn Internal Combustion Engine	Model VGF 36GL	925 bhp 7.1 MMBTU/hr (HHV) 2197 cubic inch displacement



## II. Equipment

**Table II B – Abatement Devices**

A-#	Description	Source(s) Controlled	Applicable Requirement	Operating Parameters	Limit or Efficiency
1	Selective Catalytic Reduction System	S-1, S-2	BAAQMD Condition #16676, part 21b	None	2.5 ppmv NO <sub>x</sub> @ 15% O <sub>2</sub> , dry, 1-hr average
2	Oxidation Catalyst	S-1, S-2	BAAQMD Condition #16676, part 21d	None	6 ppmv CO @ 15% O <sub>2</sub> , dry, 3-hr average
3	Selective Catalytic Reduction System	S-3, S-4	BAAQMD Condition #16676, part 21b	None	2.5 ppmv NO <sub>x</sub> @ 15% O <sub>2</sub> , dry, 1-hr average
4	Oxidation Catalyst	S-3, S-4	BAAQMD Condition #16676, part 21d	None	6 ppmv CO @ 15% O <sub>2</sub> , dry, 3-hr average
5	Selective Catalytic Reduction System	S-5	BAAQMD Condition #16676, part 29	None	9 ppmv NO <sub>x</sub> @ 3% O <sub>2</sub> , dry, 3-hr average

**Table II C – Significant Sources**

The following source is exempt from the requirement to obtain an authority to construct and permit to operate, but is defined as a significant source pursuant to BAAQMD Regulation 2-6-239.

S-#	Description	Make or Type	Model	Capacity
8	Cooling Tower			8 cell 110,600 gpm

### III. GENERALLY APPLICABLE REQUIREMENTS

The permit holder shall comply with all applicable requirements, including those specified in the BAAQMD and SIP Rules and Regulations and other federal requirements cited below. These requirements apply in a general manner to the facility and/or to sources exempt from the requirement to obtain a District Permit to Operate. The District has determined that these requirements would not be violated under normal, routine operations, and that no additional periodic monitoring or reporting to demonstrate compliance is warranted. In cases where a requirement, in addition to being generally applicable, is also specifically applicable to one or more sources, the requirement and the source are also included in Section IV, Source-Specific Applicable Requirements, of this permit.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered significant sources pursuant to the definition in BAAQMD Rule 2-6-239.

Portable equipment operating in accordance with the ARB portable equipment registration program and temporary equipment such as sandblasting equipment may be operated at the facility as long as the source is not significant under Rule 2-6-239. Otherwise the significant source would need to be included in the Title V permit.

The dates in parentheses in the Title column identify the versions of the regulations being cited and are, as applicable:

1. BAAQMD regulation(s): The date(s) of adoption or most recent amendment of the regulation by the District Board of Directors
2. Any federal requirement, including a version of a District regulation that has been approved into the SIP: The most recent date of EPA approval of any portion of the rule, encompassing all actions on the rule through that date

The full language of SIP requirements is on EPA Region 9's website. The address is: <http://yosemite.epa.gov/r9/r9sips.nsf/Agency?ReadForm&count=500&state=California&cat=Bay+Area+Air+Quality+Management+District-Agency-Wide+Provisions>

**NOTE:**

There are differences between the current BAAQMD rules and the versions of the rules in the SIP. All sources must comply with both versions of the rule until US EPA has reviewed and approved the District's revision of the regulation.

### III. Generally Applicable Requirements

**Table III**  
**Generally Applicable Requirements**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>
BAAQMD Regulation 1	General Provisions and Definitions (7/19/06)	N
SIP Regulation 1	General Provisions and Definitions (6/28/99)	Y
BAAQMD Regulation 2, Rule 1	General Requirements (7/19/06)	N
SIP Regulation 2, Rule 1	General Requirements (1/26/99)	Y
BAAQMD 2-1-429	Federal Emissions Statement (12/21/04)	Y
SIP Regulation 2-1-429	Federal Emissions Statement (4/3/95)	Y
BAAQMD Regulation 2, Rule 2	Permits, New Source Review (6/15/05)	N
SIP Regulation 2, Rule 2	Permits, New Source Review (1/26/99)	Y
BAAQMD Regulation 2, Rule 3	Permits, Power Plants (12/19/79)	Y
BAAQMD Regulation 2, Rule 4	Permits, Emissions Banking (12/21/04)	N
SIP Regulation 2, Rule 4	Permits, Emissions Banking (01/26/99)	Y
BAAQMD Regulation 2, Rule 5	New Source Review of Toxic Air Contaminants (6/15/05)	N
BAAQMD Regulation 2, Rule 6	Permits, Major Facility Review (4/16/03)	N
SIP Regulation 2, Rule 6	Permits, Major Facility Review (6/23/95)	Y
BAAQMD Regulation 2, Rule 9	Permits, Interchangeable Emission Reduction Credits (6/15/05)	N
BAAQMD Regulation 3	Fees	N
BAAQMD Regulation 4	Air Pollution Episode Plan (3/20/91)	N
SIP Regulation 4	Air Pollution Episode Plan (8/06/90)	Y
BAAQMD Regulation 5	Open Burning (3/6/02)	N
SIP Regulation 5	Open Burning (9/4/98)	Y
BAAQMD Regulation 6, Rule 1	Particulate Matter, General Requirements (12/5/07)	N
SIP Regulation 6	Particulate Matter and Visible Emissions (9/4/98)	Y
BAAQMD Regulation 7	Odorous Substances (3/17/82)	N
BAAQMD Regulation 8, Rule 1	Organic Compounds - General Provisions (6/15/94)	Y
BAAQMD Regulation 8, Rule 2	Organic Compounds – Miscellaneous Operations (7/20/05)	N
SIP Regulation 8, Rule 2	Organic Compounds – Miscellaneous Operations (3/22/95)	Y
BAAQMD Regulation 8, Rule 3	Organic Compounds - Architectural Coatings (11/21/01)	Y
BAAQMD Regulation 8, Rule 4	Organic Compounds – General Solvent and Surface Coating Operations (10/16/02)	Y

### III. Generally Applicable Requirements

**Table III**  
**Generally Applicable Requirements**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>
BAAQMD Regulation 8, Rule 15	Organic Compounds – Emulsified and Liquid Asphalts (6/1/94)	Y
BAAQMD Regulation 8, Rule 40	Organic Compounds – Aeration of Contaminated Soil and Removal of Underground Storage Tanks (6/15/05)	N
SIP Regulation 8, Rule 40	Organic Compounds – Aeration of Contaminated Soil and Removal of Underground Storage Tanks (4/19/01)	Y
BAAQMD Regulation 8, Rule 47	Organic Compounds – Air Stripping and Soil Vapor Extraction Operations (6/15/05)	N
SIP Regulation 8, Rule 47	Organic Compounds – Air Stripping and Soil Vapor Extraction Operations (4/26/95)	Y
BAAQMD Regulation 8, Rule 49	Organic Compounds - Aerosol Paint Products (12/20/95)	N
SIP Regulation 8, Rule 49	Organic Compounds - Aerosol Paint Products (3/22/95)	Y
BAAQMD Regulation 8, Rule 51	Organic Compounds - Adhesive and Sealant Products (7/17/02)	N
SIP Regulation 8, Rule 51	Organic Compounds - Adhesive and Sealant Products (2/26/02)	Y
BAAQMD Regulation 11, Rule 2	Hazardous Pollutants - Asbestos Demolition, Renovation and Manufacturing (10/7/98)	Y
BAAQMD Regulation 12, Rule 4	Miscellaneous Standards of Performance - Sandblasting (7/11/90)	N
SIP Regulation 12, Rule 4	Miscellaneous Standards of Performance - Sandblasting (9/2/81)	Y
California Health and Safety Code Section 44300 et seq.	Air Toxics “Hot Spots” Information and Assessment Act of 1987	N
California Health and Safety Code Section 41750 et seq.	Portable Equipment	N
California Health and Safety Code Title 17, Section 93115 et seq.	Airborne Toxic Control Measure for Stationary Compression Ignition Engines	N
California Health and Safety Code Title 17, Section 93116	Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater	N

### III. Generally Applicable Requirements

**Table III**  
**Generally Applicable Requirements**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>
40 CFR Part 61, Subpart M	National Emission Standards for Hazardous Air Pollutants – National Emission Standard for Asbestos (6/19/95)	Y
EPA Regulation 40 CFR 82	Protection of Stratospheric Ozone (03/12/04)	Y
Subpart F, 40 CFR 82.156	Recycling and Emissions Reductions – Required Practices (04/13/05)	Y
Subpart F, 40 CFR 82.161	Recycling and Emissions Reductions – Technician Certification (04/13/05)	Y
Subpart F, 40 CFR 82.166	Recycling and Emissions Reductions – Reporting and Recordkeeping Provisions (04/13/05)	Y
40 CFR Part 82, Subpart H	Protection of Stratospheric Ozone; Halon Emissions Reduction (03/05/98)	Y
Title 40 Part 82 Subpart H 82.270(b)	Prohibitions, Halon (03/05/98)	Y
BAAQMD Condition 16676, Part 54	Implementation of BAAQMD Regulation 4, Air Pollution Episode Plan	Y

#### IV. SOURCE-SPECIFIC APPLICABLE REQUIREMENTS

The permit holder shall comply with all applicable requirements, including those specified in the BAAQMD and SIP Rules and Regulations and other federal requirements cited below. The requirements cited in the following tables apply in a specific manner to the indicated source(s).

The dates in parentheses in the Title column identify the versions of the regulations being cited and are, as applicable:

1. BAAQMD regulation(s): The date(s) of adoption or most recent amendment of the regulation by the District Board of Directors.
2. Any federal requirement, including a version of a District regulation that has been approved into the SIP: The most recent date of EPA approval of any portion of the rule, encompassing all actions on the rule through that date.

The full text of each permit condition cited is included in Section VI, Permit Conditions, of this permit. The full language of SIP requirements is on EPA Region 9's website. The address: <http://yosemite.epa.gov/r9/r9sips.nsf/Agency?ReadForm&count=500&state=California&cat=Bay+Area+Air+Quality+Management+District-Agency-Wide+Provisions> is All other text may be found in the regulations themselves.

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
<b>BAAQMD Regulation 1</b>	<b>General Provisions and Definitions (7/9/08)</b>		
1-107	Combination of Emissions	Y	
1-520	Continuous Emission Monitoring	Y	
1-520.1	Monitoring of NO <sub>x</sub> , CO <sub>2</sub> , or O <sub>2</sub>	Y	
1-520.8	Monitors required per Reg. 2-1-403	Y	
1-522	Continuous Emission Monitoring and Recordkeeping Procedures	Y	
1-522.1	approval of plans and specifications	Y	
1-522.2	scheduling requirements	Y	
1-522.3	CEM performance testing	Y	
1-522.4	reporting of inoperative CEMs	Y	
1-522.5	CEM calibration requirements	Y	
1-522.6	CEM accuracy requirements	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
1-522.7	emission limit exceedance reporting requirements	N	
1-522.8	monitoring data submittal requirements	Y	
1-522.9	recordkeeping requirements	Y	
1-523	Parametric Monitoring and Recordkeeping Procedures	Y	
1-523.1	Parametric monitor periods of non operation	Y	
1-523.2	Limits on periods of non operation	Y	
1-523.3	Reports of Violations	N	
1-523.4	Records	Y	
1-523.5	Maintenance and calibration	N	
1-602	Area and Continuous Emission Monitoring Requirements	Y	
<b>SIP Regulation 1</b>	<b>General Provisions and Definitions (6/28/99)</b>		
1-522	Continuous Emission Monitoring and Recordkeeping Procedures	Y	
1-522.7	Monitor excesses	Y	
1-523	Parametric Monitoring and Recordkeeping Procedures	Y	
1-523.3	Reports of Violations	Y	
<b>BAAQMD Regulation 2, Rule 1</b>	<b>Regulation 2, Rule 1 - Permits, General Requirements (7/19/06)</b>		
2-1-501	Monitors	Y	
<b>BAAQMD Regulation 6, Rule 1</b>	<b>Particulate Matter, General Requirements (12/5/07)</b>		
6-1-301	Ringelmann Number 1 Limitation	N	
6-1-304	Tube Cleaning (HRSG Only)		
6-1-305	Visible Particles	N	
6-1-310	Particulate Weight Limitation	N	
6-1-310.3	Heat Transfer Operations (HRSG Only)		
6-1-401	Appearance of Emissions	N	
<b>SIP Regulation 6</b>	<b>Particulate Matter and Visible Emissions (9/4/98)</b>		
6-301	Ringelmann Number 1 Limitation	Y	
6-304	Tube Cleaning (HRSG Only)		

## IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
6-305	Visible Particles	Y	
6-310	Particulate Weight Limitation	Y	
6-310.3	Heat Transfer Operations	Y	
6-401	Appearance of Emissions	Y	
<b>BAAQMD Regulation 9, Rule 1</b>	<b>Inorganic Gaseous Pollutants – Sulfur Dioxide (3/15/95)</b>		
9-1-301	Limitations on Ground Level Concentrations	Y	
9-1-302	General Emission Limitations	Y	
<b>BAAQMD Regulation 9, Rule 3</b>	<b>Inorganic Gaseous Pollutants, Nitrogen Oxides From Heat Transfer Operations (3/17/82)</b>		
9-3-303	New or Modified Heat Transfer Operation Limits	N	
<b>BAAQMD Regulation 9, Rule 9</b>	<b>Inorganic Gaseous Pollutants-Nitrogen Oxides from Stationary Gas Turbines (12/6/06)</b>		
9-9-113	Exemption – Inspection/Maintenance	N	
9-9-114	Exemption – Start-Up/Shutdown	N	
9-9-301	Emission Limits, General	N	
9-9-301.1.3	Emission Limits- Turbines Rated $\geq 10$ MW w/SCR	N	
9-9-301.2	Emission Limits, General	N	
9-9-401	Certification, Efficiency	N	
9-9-501	Monitoring and recordkeeping requirements	N	
<b>SIP Regulation 9 Rule 9</b>	<b>Inorganic Gaseous Pollutants-Nitrogen Oxides from Stationary Gas Turbines (12/15/97)</b>		
9-9-113	Exemption – Inspection/Maintenance	Y	
9-9-114	Exemption – Start-Up/Shutdown	Y	
9-9-301	Emission Limits, General	Y	
9-9-301.3	Emission Limits, Turbines greater than 10 MW with SCR, NO <sub>x</sub> less than 9 ppmv (dry, 15% O <sub>2</sub> )	Y	
9-9-501	Monitoring and recordkeeping requirements	Y	



#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 10 Subpart GG</b>	<b>NSPS Incorporation by Reference, Stationary Gas Turbines (2/16/2000)</b>		
10-40.	Subpart GG - Standards of Performance For Stationary Gas Turbines	Y	
<b>BAAQMD Manual of Procedures, Volume V</b>	<b>Continuous Emission Monitoring Policy and Procedures (1/20/82)</b>	Y	
<b>40 CFR 60 Subpart A</b>	<b>Standards of Performance for New Stationary Sources – General Provisions (1/28/09)</b>	Y	
60.7	Notification and Recordkeeping	Y	
60.8	Performance Tests	Y	
60.9	Availability of Information	Y	
60.11(a)	Compliance with standards in this part	Y	
60.11(d)	Minimizing emissions	Y	
60.12	Circumvention	Y	
60.13	Monitoring Requirements	Y	
60.19	General notification and reporting requirements	Y	
<b>Subpart Da</b>	<b>Standards of Performance for Electric Utility Steam Generating Units for Which Construction Is Commenced after September 18, 1978 (1/28/09)</b>	Y	
60.42Da(a)(1)	Particulate Limit	Y	
60.42Da(b)	Opacity Limit	Y	
60.43Da(b)(2)	SO <sub>2</sub> limit	Y	
60.43Da(g)	Averaging 30-day rolling average (24-hour for Bay Area)	Y	
60.44Da(a)(1)	NO <sub>x</sub> limit 0.2 lb/MMBtu	Y	
60.44Da(a)(2)	NO <sub>x</sub> reduction requirement of 25% for gaseous fuels	Y	
60.44Da(d)(1)	NO <sub>x</sub> limit-1.6 lbs/MW-hr	Y	
60.48Da	Compliance provisions	Y	
60.48Da(j)	Compliance provisions for duct burners subject to Section 60.44Da(a)(1)	Y	
60.48Da(k)	Compliance provisions for duct burners subject to Section 60.44Da(d)(1)	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
60.48Da(q)	Compliance provisions for sources subject to 60.42Da(b)	Y	
60.49Da	Emission monitoring	Y	
60.49Da(a)	Opacity monitoring <sup>1</sup>	Y	
60.49Da(c)	NO <sub>x</sub> CEMs	Y	
60.49Da(k)	MW output monitoring	Y	
60.49Da(n)	Fuel flow monitoring	Y	
60.49Da(o)	Duct burners not required to install CEM for NO <sub>x</sub> , wattmeter for MW, gauges for steam flow and pressure, and continuous flow monitoring system.	Y	
60.49Da(s)	Unit specific monitoring plan for each monitoring system.	Y	
60.50Da	Compliance determination procedures and methods	Y	
60.51Da	Reporting Requirements	Y	
60.51Da(f)	For any periods for which NO <sub>x</sub> emissions data are unavailable	Y	
60.51Da(h)	Signed Statement indicating CEM quality assurance requirements have been performed, data used to show compliance obtained in accordance with approved methods and procedures, minimum data requirements met, compliance with standards achieved during reporting period.	Y	
60.51Da(i)	Opacity exceedances	Y	
60.51Da(j)	Semiannual reports	Y	
60.52Da	Recordkeeping Requirements	Y	
60.52Da(b)	Opacity recordkeeping		
<b>Subpart GG</b>	<b>Standards of Performance for Stationary Gas Turbines (2/24/06)</b>		
60.332(a)(1)	NO <sub>x</sub> limit	Y	
60.333	Standard for sulfur dioxide	Y	
60.333(a)	SO <sub>2</sub> Concentration < 0.015 percent @15% O <sub>2</sub> (Turbine Only)	Y	
60.333(b)	Fuel Sulfur Content cannot exceed 0.8 percent by weight (Turbine Only)	Y	
60.334	Monitoring of operations	Y	
60.334(c)	NO <sub>x</sub> CEMs	Y	

<sup>1</sup> The EPA has recently promulgated changes to Subpart Da in direct final rule action (Federal Register, January 20, 2011) allowing the permitting authority to exempt owners/operators of affected facilities burning only natural gas from the opacity monitoring requirements contained in 60.49Da(a)(3). The District is exempting the facility from the opacity monitoring requirement contained in 60.49Da(a)(3).

## IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
60.334(h)(3)	Exemption from sulfur fuel monitoring requirements (Natural Gas)	Y	
60.334(j)(1)(iii)	NO <sub>x</sub> Excess Emissions and Monitor Downtime reporting requirements	Y	
60.335	Test Methods and Procedures	Y	
<b>40 CFR 60 Appendix B</b>	<b>Performance Specifications</b>	Y	
Performance Specification 2	Specifications and test procedures for SO <sub>2</sub> and NO <sub>x</sub> continuous emission monitoring systems in stationary sources	Y	
Performance Specification 3	Specifications and test procedures for O <sub>2</sub> and CO <sub>2</sub> continuous emission monitoring systems	Y	
<b>40 CFR 60 Appendix F</b>	<b>Quality Assurance Procedures</b>		
Procedure 1	Quality assurance requirements for gas continuous emission monitoring systems used for compliance determination	Y	
<b>40 CFR Part 72</b>	<b>Title IV – Acid Rain Program</b>	Y	
	Subpart A – Acid Rain Program General Requirements		
72.6	Applicability	Y	
72.6(a)(3)	New utility unit (at the time of commencement of commercial operation)	Y	
72.9	Standard Requirements	Y	
72.9(a)	Permit Requirements	Y	
72.9(a)(1)(i)	Submittal of a complete acid rain permit application	Y	
72.9(a)(1)(iii)	Submittal of information in a timely manner	Y	
72.9(a)(2)(i)	Operation in compliance with Acid Rain permit	Y	
72.9(a)(2)(ii)	Have an Acid Rain Permit	Y	
72.9(b)	Monitoring Requirements	Y	
72.9(c)	Sulfur Dioxide Requirements	Y	
72.9(c)(1)	Requirement to hold allowances as of allowance transfer deadline	Y	
72.9(c)(2)	Each ton of excess SO <sub>2</sub> emissions is a separate violation of the CAA	Y	
72.9(c)(3)	Initial deadline to hold allowances	Y	
72.9(c)(3)(iv)	Deadline at time of monitor certification	Y	
72.9(c)(4)	Use of Allowance Tracking System	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
72.9(c)(5)	Allowances may not be deducted prior to year for which allowance was allocated	Y	
72.9(c)(6)	Limited authorization	Y	
72.9(e)	Excess emissions requirements	Y	
72.9(f)	Recordkeeping and Reporting Requirements	Y	
72.9(g)	Liability	Y	
72.9(h)	Effect on Other Authorities	Y	
	Subpart C – Acid Rain Permit Applications		
72.30(a)	Requirement to apply	Y	
72.30(c)	Duty to reapply. Requirement to submit complete acid rain application 6 months prior to expiration of current acid rain permit.	Y	
72.31	Information requirements for Acid Rain permit applications	Y	
72.31(a)	Identification of affected source	Y	
72.31(b)	Identification of each affected emissions unit	Y	
72.31(c)	Complete compliance plan	Y	
72.31(d)	Standard requirements under 40 CFR 72.9	Y	
72.31(e)	If the Acid Rain permit application is for Phase II and the unit is a new unit, the date that the unit has commenced or will commence operation and the deadline for monitor certification.	Y	
72.32	Permit application shield and binding effect of permit application	Y	
	Subpart E – Acid Rain Permit Contents		
72.50	General	Y	
72.50(a)	Acid Rain Permits	Y	
72.50(a)(1)	Permits must contain all elements of complete Acid Rain Application under 40 CFR 72.31	Y	
72.50(b)	Permits include terms in 40 CFR 72.2	Y	
72.51	Permit Shield	Y	
<b>40 CFR Part 75</b>	<b>Code of Federal Regulations, Continuous Emissions Monitoring</b>	Y	
	Subpart A – General	Y	
75.2	Applicability	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
75.2(a)	Applicability to affected units subject to Acid Rain emission limitations	Y	
75.2(c)	The provisions of this part apply to sources subject to a State or federal NO <sub>x</sub> mass emission reduction program, to the extent these provisions are adopted as requirements under such a program	Y	
75.4	Compliance Dates	Y	
75.4(b)	New affected unit (at the time of the commencement of commercial operation) shall ensure that all monitoring systems required under this part for monitoring of SO <sub>2</sub> , NO <sub>x</sub> , CO <sub>2</sub> , opacity, and volumetric flow are installed and all certification tests are completed on or before the later of the following dates	Y	
75.4(b)(2)	The earlier of 90 unit operating days or 180 calendar days after the date the unit commences commercial operation, notice of which date shall be provided under subpart G of this part.	Y	
75.5	Prohibitions	Y	
	Subpart B – Monitoring Provisions	Y	
75.10	General Operating Requirements	Y	
75.10(a)	Primary Measurement Requirement	Y	
75.10(a)(1)	SO <sub>2</sub> Emissions, except as provided in §§75.11 and 75.16 and subpart E of this part	Y	
75.10(a)(2)	NO <sub>x</sub> Emissions, except as provided in §§75.12 and 75.17 and subpart E of this part	Y	
75.10(a)(3)	CO <sub>2</sub> Emissions	Y	
75.10(a)(3)(ii)	CO <sub>2</sub> Emissions estimated using Carbon Content of fuel and procedures in Appendix G.	Y	
75.10(b)	Primary Equipment Performance Requirements Requires each CEM to meet equipment, installation, and performance specifications in part 75, Appendix A and quality assurance/quality control requirements in part 75 Appendix B.	Y	
75.10(c)	Heat Input Rate Measurement Requirement	Y	
75.10(d)	Primary equipment hourly operating requirements	Y	

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**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
75.10(d)(1)	Cycles of operation for each 15 minute period. Hourly average calculated from a minimum of four 15 minute periods.	Y	
75.10(d)(3)	Validity of data and data substitution	Y	
75.10(f)	Minimum measurement capability requirement	Y	
75.10(g)	Minimum recording and recordkeeping requirements	Y	
75.11	Specific provisions for monitoring SO <sub>2</sub> emissions	Y	
75.11(d)	Gas-fired and oil-fired units	Y	
75.11(d)(2)	Allows the use of Appendix D Optional SO <sub>2</sub> Emissions Data Protocol for Gas-Fired and Oil-Fired Units to monitor SO <sub>2</sub> emissions.	Y	
75.12	Specific provisions for monitoring NO <sub>x</sub> emission rates	Y	
75.12(a)	NO <sub>x</sub> continuous emission monitor and diluent monitoring requirement	Y	
75.12(c)	NO <sub>x</sub> mass emission rate determination according to Appendix F	Y	
75.13	Specific provisions for monitoring CO <sub>2</sub> emissions	Y	
75.13(b)	Determination of CO <sub>2</sub> emissions using Appendix G	Y	
75.14	Specific Provisions for monitoring opacity	Y	
75.14(c)	Gas-Fired Units Exempt from Opacity Monitoring	Y	
	Subpart C – Operation and Maintenance Requirements	Y	
75.20	Initial certification and recertification procedures	Y	
75.20(a)	Initial certification and approval process	Y	
75.20(b)	Recertification approval process	Y	
75.20(c)	Initial certification and recertification procedures	Y	
75.20(g)	Initial certification and recertification procedures for excepted monitoring systems under appendices D and E	Y	
75.21	Quality assurance and quality control requirements	Y	
75.21(a)	Continuous emission monitoring systems	Y	
75.21(c)	Calibration gases	Y	
75.21(d)	Notification for periodic Relative Accuracy Test Audits	Y	
75.21(e)	Consequences of audits	Y	
75.22	Reference test methods	Y	
75.24	Out-of-control periods and adjustment for system bias	Y	
	Subpart D – Missing Data Substitution Procedures	Y	
75.30	General Provisions	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
75.30(a)	Owner/operator shall provide substitute data for each affected unit using a continuous emission monitor according to this subpart whenever the unit is combusting fuel.	Y	
75.31	Initial missing data procedures	Y	
75.32	Determination of monitor data availability for standard missing data procedures	Y	
75.33	Standard missing data procedures for SO, NO, Hg, and flow rate	Y	
75.33(a)	Following initial certification and after following initial missing data procedures for 2,160 quality assured operating hours for NO <sub>x</sub> continuous emissions monitors system the owner/operator shall follow the data substitution procedures in paragraph (b) and (c) of this section.	Y	
75.33(c)	Volumetric flow rate, NO <sub>x</sub> emission rate and NO <sub>x</sub> concentration data	Y	
75.34	Units with add-on emission controls	Y	
75.35	Missing data procedures for CO <sub>2</sub>	Y	
75.36	Missing data procedures for heat input rate determinations	Y	
	Subpart F – Recordkeeping Requirements	Y	
75.53	Monitoring plan	Y	
75.53(a)	General provisions	Y	
75.53(b)	Updates to monitoring plan	Y	
75.53(e)	Contents of monitoring plan	Y	
75.53(f)	Contents of monitoring plan for specific situations	Y	
75.53(g)	Contents of the monitoring plan after January 1, 2009	Y	
75.53(h)	Contents of monitoring plan for specific situations	Y	
75.57	General recordkeeping provisions	Y	
75.57(a)	General recordkeeping provisions for affected sources	Y	
75.57(b)	Operating parameter record provisions. The owner or operator shall record for each hour the following information on unit operating time, heat input rate, and load, separately for each affected unit.	Y	
75.57(c)	SO <sub>2</sub> emission record provisions	Y	
75.57(d)	NO <sub>x</sub> emission record provisions	Y	
75.57(e)	CO <sub>2</sub> emission record provisions	Y	
75.57(g)	Diluent record provisions	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
75.57(h)	Missing data records	Y	
75.58	General recordkeeping provisions for specific situations	Y	
75.58(b)	Specific parametric data record provisions for calculating substitute emissions data for units with add-on emission controls	Y	
75.58(c)	Specific SO <sub>2</sub> emission record provisions for gas-fired or oil-fired units using optional protocol in appendix D to this part. In lieu of recording the information in §75.57(c), the owner or operator shall record the applicable information in this paragraph for each affected gas-fired or oil-fired unit for which the owner or operator is using the optional protocol in appendix D to this part for estimating SO <sub>2</sub> mass emissions	Y	
75.59	Certification, quality assurance, and quality control record provisions	Y	
75.59(a)	Continuous emission or opacity monitoring systems	Y	
75.59(b)	Excepted monitoring systems for gas-fired and oil-fired units. The owner or operator shall record the applicable information in this section for each excepted monitoring system following the requirements of appendix D to this part or appendix E to this part for determining and recording emissions from an affected unit.	Y	
75.59(c)	Except as otherwise provided in §75.58(b)(3)(i), units with add-on SO <sub>2</sub> or NO <sub>x</sub> emission controls following the provisions of §75.34(a)(1) or (a)(2), and for units with add-on Hg emission controls, the owner or operator shall keep the following records on-site in the quality assurance/quality control plan required by section 1 of appendix B to this part:	Y	
75.59(f)	DAHS Verification. For each DAHS (missing data and formula) verification that is required for initial certification, recertification, or for certain diagnostic testing of a monitoring system, record the date and hour that the DAHS verification is successfully completed. (This requirement only applies to units that report monitoring plan data in accordance with §75.53(g) and (h).)	Y	
	Subpart G – Reporting Requirements	Y	
75.60	General Provisions	Y	
75.61	Notifications	Y	



#### IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
75.62	Monitoring plan submittals	Y	
75.63	Initial certification or recertification application	Y	
75.64	Quarterly reports	Y	
75.66	Petitions to the administrator	Y	
40 CFR Part 98	Mandatory Greenhouse Gas Reporting		
Subpart A	General Provisions		
98.1	Purpose and scope	Y	
98.2	Who must report?	Y	
98.2(a)(1)(i)	Electricity Generation	Y	
98.2(g)	If a capacity or generation reporting threshold in paragraph (a)(1) of this section applies, the owner or operator shall review the appropriate records and perform any necessary calculations to determine whether the threshold has been exceeded	Y	
98.2(i)	Duration of reporting	Y	
98.3	What are the general monitoring, reporting, recordkeeping and verification requirements of this part?	Y	
98.3(a)	General	Y	
98.3(b)	Schedule	Y	
98.3(c)	Content of the annual report	Y	
98.3(d)	Special provisions for reporting year 2010	Y	
98.3(e)	Emission calculations	Y	
98.3(f)	Verification	Y	
98.3(g)	Recordkeeping	Y	
98.3(h)	Annual GHG report revisions	Y	
98.3(i)	Calibration accuracy requirements	Y	
98.4	Authorization and responsibilities of the designated representative	Y	
98.5	How is the report submitted?	Y	
98.8	What are the compliance and enforcement provisions of this part?	Y	
Subpart D	Electricity Generation	Y	
98.40	Definition of source category	Y	
98.41	Reporting threshold	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – A**  
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**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
98.42	GHGs to report	Y	
98.43	Calculating GHG emissions	Y	
98.44	Monitoring and QA/QC requirements	Y	
98.45	Procedures for estimating missing data	Y	
98.46	Data reporting requirements	Y	
98.47	Records that must be retained	Y	
<b>CA Code of Regulations, Title 17, Subchapter 10, Article 2</b>	<b>Mandatory Greenhouse Gas Emissions Reporting</b>		
§ 95101(b)(4)	Applicability (electricity generating facilities)	N	
Subarticle 1	General Requirements for the Mandatory Reporting of Greenhouse Gas Emissions		
§ 95103(a)	General Greenhouse Gas Reporting Requirements	N	
§ 95103(a)(1)	Report Content	N	
§ 95103(a)(2)	Stationary Sources	N	
§ 95103(b)	Reporting Schedule – Existing Facilities	N	
§ 95103(c)	Verification – Existing Facilities	N	
§ 95104	Greenhouse Gas Emissions Data Report	N	
§ 95104(a)	Emissions Data Report	N	
§ 95104(b)	Maintaining the GHG Inventory Program	N	
§ 95104(c)	Data Completeness	N	
§ 95104(d)	Revisions	N	
§ 95105	Document Retention and Record Keeping Requirements	N	
§ 95106	Confidentiality	N	
§ 95107	Enforcement	N	
§ 95108	Severability	N	
§ 95111(a)	Data Requirements and Calculation Methods for Electricity Generating Facilities	N	
§ 95111(c)	Calculation of CO <sub>2</sub> Emissions from Stationary Combustion	N	
§ 95111(d)	Calculation of N <sub>2</sub> O and CH <sub>4</sub> from Stationary Combustion	N	

## IV. Source-specific Applicable Requirements

**Table IV – A**  
**Source-specific Applicable Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
§ 95111(f)	Determining Fugitive SF <sub>6</sub> Emissions	N	
§ 95111(g)	Determining Fugitive HFC Emissions	N	
Subarticle 3	Calculation Methods Applicable To Multiple Types of Facilities		
§ 95125	Additional Calculation Methods	N	
Subarticle 4	Requirements for Verification of Greenhouse Gas Emissions Data Reports and Requirements Applicable to Emissions Data Verifiers		
§ 95130	Requirements for Verification of Emissions Data Reports	N	
<b>BAAQMD Condition #16676</b>			
Definitions	Definitions	Y	
part 14	Requirement for combustion of natural gas with a maximum sulfur content of 1 gr/100 scf (BACT for SO <sub>2</sub> and PM <sub>10</sub> )	Y	
part 15	Hourly heat input limit (PSD for NO <sub>x</sub> )	Y	
part 16	Daily heat input limit (PSD for PM <sub>10</sub> )	Y	
part 17	Annual heat input limit (Offsets)	Y	
part 18	Duct burners shall not be fired unless turbines are in operation (BACT for NO <sub>x</sub> , CO, POC)		
part 19	Oxidizing catalyst and SCR requirement for S-1 (BACT for NO <sub>x</sub> and CO)	Y	
part 20	Oxidizing catalyst and SCR requirement for S-3 (BACT for NO <sub>x</sub> and CO)		
part 21	Emission limits (BACT, PSD, and Toxic Risk Management Policy)	Y	
part 21a	Hourly and heat-input rate NO <sub>x</sub> limits (PSD for NO <sub>x</sub> )	Y	
part 21b	NO <sub>x</sub> concentration limit (BACT for NO <sub>x</sub> )	Y	
part 21c	Hourly and heat-input rate CO limits (PSD for CO)	Y	
part 21d	CO concentration limit (BACT for CO)	Y	
part 21e	Ammonia concentration limit and monitoring (Regulation 2, Rule 5 for NH <sub>3</sub> )	N	
part 21f	Hourly and heat-input rate POC limits (BACT for POC)	Y	
part 21g	Hourly and heat-input rate SO <sub>2</sub> limits (BACT for SO <sub>2</sub> )	Y	
part 21h	Hourly and heat-input rate PM <sub>10</sub> limits (BACT for PM <sub>10</sub> )	Y	

## IV. Source-specific Applicable Requirements

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**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
part 23	Limits during startup, shutdown, steam turbine cold start-up, or combustor tuning (PSD)	Y	
part 24	Turbines may not be in startup mode simultaneously	Y	
part 24	Limit on operation to support steam turbine cold start-up or combustor tuning (PSD)	Y	
part 30	Facility daily heat input limit (PSD, CEC Offsets)	Y	
part 31	Facility annual heat input limit (Offsets)	Y	
part 32	Facility daily emission limits (CEQA, PSD, BACT)	Y	
part 33	Facility annual emission limits (Offsets, PSD, Cumulative Increase)	Y	
part 34	Facility annual emission limits for toxic air contaminants (Regulation 2, Rule 5)	N	
part 35	Monitoring (1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)	Y	
part 36	Calculation of emissions and recordkeeping (Offsets, PSD, Cumulative Increase)	Y	
part 37	Calculation of emissions and recordkeeping for toxic air contaminants (Regulation 2, Rule 5)	N	
part 38	Ammonia source test (Regulation 2, Rule 5)	N	
part 39	Source to assure compliance with part 21a, b, c, d and f (BACT, offsets)	Y	
part 41	District review of source test procedures (BACT)	Y	
part 42	Initial and biennial source tests for toxic air contaminants (Regulation 2, Rule 5)	N	
part 43	Submittal of reports (2-6-502)	Y	
part 44	Retention of records for five years (2-6-501)	Y	
part 45	Notification of violations to District (2-1-403)	Y	
part 46	Stack heights (PSD, Regulation 2, Rule 5)	Y	
part 47	Sampling ports and platforms (1-501)	Y	
part 55	Records of steam turbine cold start-ups and combustor tuning (PSD)	Y	

#### IV. Source-specific Applicable Requirements

**Table IV – B**  
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**S-5, AUXILIARY BOILER**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 1</b>	<b>General Provisions and Definitions (7/9/08)</b>		
1-520	Continuous Emission Monitoring	Y	
1-520.1	Monitoring of NO <sub>x</sub> , CO <sub>2</sub> or O <sub>2</sub>	Y	
1-520.8	Monitors required per Reg. 2-1-403	Y	
1-522	Continuous Emission Monitoring and Recordkeeping Procedures	Y	
1-523	Parametric Monitoring and Recordkeeping Procedures	Y	
1-602	Area and Continuous Emission Monitoring Requirements	Y	
<b>SIP Regulation 1</b>	<b>General Provisions and Definitions (6/28/99)</b>		
1-522	Continuous Emission Monitoring and Recordkeeping Procedures	Y	
1-523	Parametric Monitoring and Recordkeeping Procedures	Y	
<b>BAAQMD Regulation 6, Rule 1</b>	<b>Particulate Matter, General Requirements (12/5/07)</b>		
6-1-301	Ringelmann Number 1 Limitation	N	
6-1-304	Tube Cleaning	N	
6-1-305	Visible Particles	N	
6-1-310	Particulate Weight Limitation	N	
6-1-310.3	Heat Transfer Operations	N	
<b>SIP Regulation 6</b>	<b>Particulate Matter and Visible Emissions (9/4/98)</b>		
6-301	Ringelmann Number 1 Limitation	Y	
6-304	Tube Cleaning	Y	
6-305	Visible Particles	Y	
6-310	Particulate Weight Limitation	Y	
6-310.3	Heat Transfer Operations	Y	
<b>BAAQMD Regulation 9, Rule 1</b>	<b>Inorganic Gaseous Pollutants - Sulfur Dioxide (3/15/95)</b>		
9-1-301	Limitations on Ground Level Concentrations	Y	
9-1-302	General Emission Limitations	Y	

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**S-5, AUXILIARY BOILER**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 9, Rule 3</b>	<b>Inorganic Gaseous Pollutants, Nitrogen Oxides From Heat Transfer Operations (3/17/82)</b>		
9-3-303	New or Modified Heat Transfer Operation Limits	Y	
<b>BAAQMD Regulation 9, Rule 7</b>	<b>Inorganic Gaseous Pollutants - Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (7/30/08)</b>		
9-7-117	Limited Exemption, Devices Rated 75 MM BTU/hr or Higher Limited to 9 PPMV NO <sub>x</sub> : The emission limits of Section 9-7-307.6 shall not apply to any boiler, steam generator or process heater that is limited to 9 ppmv NO <sub>x</sub>		
9-7-301	Emission Limits-Gaseous Fuel	Y	
9-7-301.1	Emission Limits-NO <sub>x</sub> , 30 ppm	Y	
9-7-301.4	Emission Limits-CO, 400 ppm	Y	
<b>SIP Regulation 9, Rule 7</b>	<b>Inorganic Gaseous Pollutants - Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (9/15/93)</b>		
9-7-301	Emission Limits-Gaseous Fuel	Y	
9-7-301.1	Emission Limits-NO <sub>x</sub>	Y	
9-7-301.2	Emission Limits-CO	Y	
9-7-503	Records	Y	
9-7-503.4	Source test records	Y	
<b>BAAQMD Manual of Procedures, Volume V</b>	<b>Continuous Emission Monitoring Policy and Procedures (1/20/82)</b>		
<b>40 CFR 60 Subpart A</b>	<b>Standards of Performance for New Stationary Sources – General Provisions (1/28/09)</b>	Y	
60.7	Notification and record keeping	Y	
60.8	Performance Tests	Y	
60.9	Availability of Information	Y	
60.11	Compliance with standards and maintenance requirement	Y	
60.12	Circumvention	Y	

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**Table IV – B**  
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**S-5, AUXILIARY BOILER**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
60.13	Monitoring Requirements	Y	
60.19	General notification and reporting requirements	Y	
<b>Subpart Db</b>	<b>Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (12/16/87)</b>	Y	
60.44b(a)(4)	NO <sub>x</sub> Emission Limit	Y	
60.44b(h)	NO <sub>x</sub> limit applicable at all times	Y	
60.44b(i)	Compliance: 24-hr day averaging period (per BAAQMD Regulation 10, part 4)	Y	
60.46b(a)	NO <sub>x</sub> limits apply at all times	Y	
60.46b(c)	Compliance with NO <sub>x</sub> limit	Y	
60.46b(e)	Performance test for NO <sub>x</sub>	Y	
60.48b(b)	CEMs for NO <sub>x</sub> Standard, except as provided in (g), (h), and (i) of this section	Y	
60.49b(a)	Notification of Initial Startup	Y	
60.49b(b)	Submittal of Performance Test Reports and CEM performance evaluation	Y	
60.49b(d)	Fuel records	Y	
60.49b(g)	Records for each day of operation	Y	
60.49b(h)(2)	Excess emission reports	Y	
60.49b(o)	Records retention for two years	Y	
<b>BAAQMD Condition #16676</b>			
Definitions	Definitions	Y	
part 25	Requirement for combustion of natural gas with a maximum sulfur content of 1 gr/100 scf (BACT for SO <sub>2</sub> and PM <sub>10</sub> )	Y	
part 26	Hourly heat input limit (Cumulative Increase)	Y	
part 27	Annual heat input limit (Cumulative Increase)	Y	
part 28	Emission limits (BACT, PSD)	Y	
part 28a	Hourly NO <sub>x</sub> limits (PSD for NO <sub>x</sub> )	Y	
part 28b	NO <sub>x</sub> concentration limit (BACT for NO <sub>x</sub> )	Y	
part 28c	Hourly CO limit (PSD for CO)	Y	
part 28d	CO concentration limit (BACT for CO)	Y	
part 28e	Hourly POC limit (BACT for POC)	Y	

## IV. Source-specific Applicable Requirements

**Table IV – B**  
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**S-5, AUXILIARY BOILER**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
part 28f	Hourly SO <sub>2</sub> limit (BACT for SO <sub>2</sub> )	Y	
part 28g	Hourly PM <sub>10</sub> limit (BACT for PM <sub>10</sub> )	Y	
part 28h	NH <sub>3</sub> concentration limit (Regulation 2, Rule 5)	N	
part 29	Requirement for design for future installation of Oxidizing Catalyst (BACT for CO)	Y	
part 29	Requirement for SCR system (BACT for NO <sub>x</sub> )	Y	
part 30	Facility daily heat input limit (PSD, CEC Offsets)	Y	
part 31	Facility annual heat input limit (Offsets)	Y	
part 32	Facility daily emission limits (CEQA, PSD, BACT)	Y	
part 33	Facility annual emission limits (Offsets, PSD, Cumulative Increase)	Y	
part 34	Facility annual emission limits for toxic air contaminants (Regulation 2, Rule 5)	N	
part 35	Monitoring (1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)	Y	
part 36	Calculation of emissions and recordkeeping (Offsets, PSD, Cumulative Increase)	Y	
part 37	Calculation of emissions and recordkeeping for toxic air contaminants (Regulation 2, Rule 5)	N	
part 40	Source to assure compliance with part 28a-d (BACT, offsets)	Y	
part 41	District review of source test procedures (BACT)	Y	
part 43	Submittal of reports (2-6-502)	Y	
part 44	Retention of records for five years (2-6-502)	Y	
part 45	Notification of violations to District (2-1-403)	Y	
part 47	Sampling ports and platforms (1-501)	Y	



## IV. Source-specific Applicable Requirements

**Table IV- C**  
**Source-specific Applicable Requirements**  
**S-6, FIRE PUMP DIESEL ENGINE**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 6, Rule 1</b>	<b>Particulate Matter, General Requirements (12/5/07)</b>		
6-1-303	Ringelmann Number 2 Limitation	N	
6-1-305	Visible Particles	N	
6-1-310	Particulate Weight Limitation	N	
6-1-401	Appearance of Emissions	N	
<b>SIP Regulation 6</b>	<b>Particulate Matter and Visible Emissions (9/4/98)</b>		
6-303	Ringelmann Number 2 Limitation	Y	
6-305	Visible Particles	Y	
6-310	Particulate Weight Limitation	Y	
6-401	Appearance of Emissions	Y	
<b>BAAQMD Regulation 9, Rule 1</b>	<b>Inorganic Gaseous Pollutants - Sulfur Dioxide (3/15/95)</b>		
9-1-301	Limitations on Ground Level Concentrations	Y	
9-1-304	Fuel Burning (Liquid and Solid Fuels)	Y	
<b>BAAQMD Regulation 9, Rule 8</b>	<b>Inorganic Gaseous Pollutants-Nitrogen Oxides from Stationary Engines (7/25/07)</b>		
9-8-110.5	Limited Exemption Emergency Standby Engines	N	
9-8-330	Emergency Standby Engines, Hours of Operation	N	
9-8-330.1	Unlimited hours for emergency use	N	
9-8-330.2	100 hours for reliability and maintenance	N	
9-8-330.3	50 hours for reliability and maintenance	N	1/1/12
9-8-530	Emergency standby engines, monitoring and recordkeeping	N	
<b>40 CFR Part 63 Subpart A</b>	<b>National Emissions Standards for Hazardous Air Pollutants for Source Categories, Subpart A – General Provisions</b>		
63.1	General Applicability of the General Provisions	Y	
63.2	Definitions	Y	
63.3	Units and Abbreviations	Y	

#### IV. Source-specific Applicable Requirements

**Table IV- C**  
**Source-specific Applicable Requirements**  
**S-6, FIRE PUMP DIESEL ENGINE**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.4	Prohibited activities and circumvention	Y	
63.6(a)	Compliance with standards and maintenance requirements - Applicability	Y	
63.6(c)	Compliance dates for existing sources	Y	
63.6(f)(2)	Methods for determining compliance	Y	
63.6(f)(3)	Finding of compliance	Y	
63.6(g)	Use of an alternative nonopacity emission standard	Y	
63.6(i)	Compliance extension procedures and criteria	Y	
63.6(j)	Presidential compliance exemption	Y	
63.10(a)	Recordkeeping and reporting requirements, applicability and general information	Y	
63.10(b)(1)	Record retention	Y	
63.10(f)	Administrator waiver of recordkeeping or reporting requirements	Y	
63.12	State authority and delegations	Y	
63.13	Addresses of air pollution control agencies and EPA Regional Offices	Y	
63.14	Incorporation by reference	Y	
63.15	Availability of information and confidentiality	Y	
<b>40 CFR Part 63 Subpart ZZZZ</b>	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)		
63.6585	Applicability		
63.6585(a)	Applicable to Stationary RICE		
63.6585(c)	Applicable to Area Source of HAPs		
63.6590(a)(1)(iii)	Affected source under stationary RICE located at an area source of HAP emissions, constructed before 6/12/06	Y	
63.6595(a)	Comply with applicable emission limitations and operating limitations by 5/3/13.	Y	5/3/13
63.6595(c)	Comply with applicable notification requirements in 63.6645 and 40 CFR Part 63, subpart A (Note there are no applicable notification requirements under either of these sections)	Y	5/3/13

#### IV. Source-specific Applicable Requirements

**Table IV- C**  
**Source-specific Applicable Requirements**  
**S-6, FIRE PUMP DIESEL ENGINE**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.6603 (a)	Comply with requirements of Table 2d (operating limitations of Tables 1b and 2b do not apply): 1. Change oil & filter every 500 hours of operation or annually, whichever comes first. Oil analysis program may be used to extend period. 2. Inspect air cleaner every 1000 hours or annually, whichever comes first, and replace as necessary. 3. Inspect all hoses and belts every 500 hours or annually, whichever comes first, and replace as necessary.	Y	5/3/13
63.6605	General Requirements 1. Must be in compliance with applicable emission limitations and operating limitations 2. Operate engine in a manner consistent with safety and good air pollution control practices to minimize emissions.	Y	5/3/13
63.6625(e)(3)	Maintain RICE and abatement controls according to manufacturer's instructions or develop own plan.	Y	5/3/13
63.6625(h)	Minimize idling, and minimize startup time to not exceed 30 minutes.		
63.6640(a)	Demonstrate compliance with the requirements of Table 2d according to work or management practices of Table 6, Part 9a.	Y	5/3/13
63.6640(b)	Report deviations from the requirements of Table 2d.	Y	5/3/13
63.6640(e)	Report non-compliance with the any applicable requirement of Table 8.	Y	5/3/13
63.6640(f)	Comply with requirements of (f)(1)(i) through (iii) below	Y	5/3/13
63.6640(f)(1)(i)	No time limit when engine is used for emergencies	Y	5/3/13
63.6640(f)(1)(ii)	Operation of engine for maintenance checks and readiness testing limited to 100 hours per year	Y	5/3/13
63.6640(f)(1)(iii)	Operation of engine for non-emergency and not associated with maintenance checks and readiness testing is limited to 50 hours, which is counted towards the 100 hours per year maximum specified in 63.6640(f)(1)(ii)	Y	5/3/13
63.6645(a)(5)	The notification requirements of 63.6645(a) do not apply to this engine.	Y	5/3/13
63.6655	Record Keeping 1. Record hours of operation 2. Install non-resettable hour meter	Y	5/3/13
63.6660	Instructions for Records	Y	5/3/13

#### IV. Source-specific Applicable Requirements

**Table IV- C**  
**Source-specific Applicable Requirements**  
**S-6, FIRE PUMP DIESEL ENGINE**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.6670	Implementation and enforcement of Subpart ZZZZ	Y	5/3/13
<b>Section 93115, title 17, CCR</b>	<b>Airborne Toxic Control Measure for Stationary Compression Ignition Engines</b>		
93115.5(b)	Fuel Requirements	N	
93115.6(b)(3)(A)	PM Emission Standards & Maximum Hours of Operation for Maintenance and Testing	N	
93115.6(b)(3)(B)	Applicable Emissions Standards for HC, NO <sub>x</sub> , NMHC+NO <sub>x</sub> , and CO	N	
93115.10	Recordkeeping, Reporting and Monitoring Requirements	N	
93115.10(a)	Reporting	N	
93115.10(c)	Demonstration of Compliance with Emission Limits	N	
93115.10(e)	Monitoring Equipment	N	
93115.10(g)	Monthly Log: Data Required	N	
93115.10(g).	Data Log Retention	N	
93115.12	Tiered Compliance Schedule	N	
<b>BAAQMD Condition #22851</b>			
part 1	34 hours/year for maintenance and testing. (Stationary Diesel Engine ATCM" section 93115, title 17 CCR, Regulation 2, Rule 5)	N	
part 2	Unlimited Emergency Use, (Stationary Diesel Engine ATCM" section 93115, title 17 CCR)	N	
part 3	Totalizing Meter, (Stationary Diesel Engine ATCM" section 93115, title 17 CCR)	N	
part 4	Recordkeeping, (Stationary Diesel Engine ATCM" section 93115, title 17 CCR, Regulation 2-6-501)	N	
part 5	Near School Conditions, (Stationary Diesel Engine ATCM" section 93115, title 17 CCR)	N	

## IV. Source-specific Applicable Requirements

**Table IV – D**  
**Source-specific Applicable Requirements**  
**S-7, NATURAL-GAS FIRED EMERGENCY GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 6, Rule 1</b>	<b>Particulate Matter, General Requirements (12/5/07)</b>		
6-1-303	Ringelmann Number 2 Limitation	N	
6-1-305	Visible Particles	N	
6-1-310	Particulate Weight Limitation	N	
6-1-401	Appearance of Emissions	N	
<b>SIP Regulation 6</b>	<b>Particulate Matter and Visible Emissions (9/4/98)</b>		
6-303	Ringelmann Number 2 Limitation	Y	
6-305	Visible Particles	Y	
6-310	Particulate Weight Limitation	Y	
6-401	Appearance of Emissions	Y	
<b>BAAQMD Regulation 9, Rule 1</b>	<b>Inorganic Gaseous Pollutants – Sulfur Dioxide (3/15/1995)</b>		
9-1-301	Limitations on Ground Level Concentrations	Y	
9-1-302	General Emission Limitation	Y	
<b>BAAQMD Regulation 9, Rule 8</b>	<b>Inorganic Gaseous Pollutants-Nitrogen Oxides from Stationary Engines (7/25/07)</b>		
9-8-110.5	Limited Exemption Emergency Standby Engines	N	
9-8-330	Emergency Standby Engines, Hours of Operation	N	
9-8-330.1	Unlimited hours for emergency use	N	
9-8-330.2	100 hours for reliability and maintenance	N	
9-8-330.3	50 hours for reliability and maintenance	N	
<b>40 CFR Part 63 Subpart A</b>	<b>National Emissions Standards for Hazardous Air Pollutants for Source Categories, Subpart A – General Provisions</b>		
63.1	General Applicability of the General Provisions	Y	
63.2	Definitions	Y	
63.3	Units and Abbreviations	Y	
63.4	Prohibited activities and circumvention	Y	
63.6(a)	Compliance with standards and maintenance requirements - Applicability	Y	

## IV. Source-specific Applicable Requirements

**Table IV – D**  
**Source-specific Applicable Requirements**  
**S-7, NATURAL-GAS FIRED EMERGENCY GENERATOR**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.6(c)	Compliance dates for existing sources	Y	
63.6(f)(2)	Methods for determining compliance	Y	
63.6(f)(3)	Finding of compliance	Y	
63.6(g)	Use of an alternative nonopacity emission standard	Y	
63.6(i)	Compliance extension procedures and criteria	Y	
63.6(j)	Presidential compliance exemption	Y	
63.10(a)	Recordkeeping and reporting requirements, applicability and general information	Y	
63.10(b)(1)	Record retention	Y	
63.10(f)	Administrator waiver of recordkeeping or reporting requirements	Y	
63.12	State authority and delegations	Y	
63.13	Addresses of air pollution control agencies and EPA Regional Offices	Y	
63.14	Incorporation by reference	Y	
63.15	Availability of information and confidentiality	Y	
<b>40 CFR Part 63 Subpart ZZZZ</b>	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)		
63.6585	Applicability		
63.6585(a)	Applicable to Stationary RICE		
63.6585(c)	Applicable to Area Source of HAPs		
63.6590(a)(1)(iii)	Affected source under stationary RICE located at an area source of HAP emissions, constructed before 6/12/06	Y	
63.6595(a)	Comply with applicable emission limitations and operating limitations by 10/19/13.	Y	10/19/13
63.6595(c)	Comply with applicable notification requirements in 63.6645 and 40 CFR Part 63, subpart A (Note there are no applicable notification requirements under either of these sections)	Y	10/19/13
63.6603(a)	Comply with requirements of Table 2d (operating limitations of Tables 1b and 2b do not apply): 1. Change oil & filter every 500 hours of operation or annually, whichever comes first. Oil analysis program may be used to extend period. 2. Inspect spark plugs every 1000 hours or annually, whichever comes first, and replace as necessary. 3. Inspect all hoses and belts every 500 hours or annually, whichever comes first, and replace as necessary.	Y	10/19/13

## IV. Source-specific Applicable Requirements

**Table IV – D**  
**Source-specific Applicable Requirements**  
**S-7, NATURAL-GAS FIRED EMERGENCY GENERATOR**

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
63.6605	General Requirements 1. Must be in compliance with applicable emission limitations and operating limitations 2. Operate engine in a manner consistent with safety and good air pollution control practices to minimize emissions.	Y	10/19/13
63.6625(e)(3)	Maintain RICE and abatement controls according to manufacturer's instructions or develop own plan.	Y	10/19/13
63.6625(h)	Minimize idling, and minimize startup time to not exceed 30 minutes.		
63.6640(a)	Demonstrate compliance with the requirements of Table 2d according to work or management practices of Table 6, Part 9a.	Y	10/19/13
63.6640(b)	Report deviations from the requirements of Table 2d.	Y	10/19/13
63.6640(e)	Report non-compliance with the any applicable requirement of Table 8.	Y	10/19/13
63.6640(f)	Comply with requirements of (f)(1)(i) through (iii) below	Y	10/19/13
63.6640(f)(1)(i)	No time limit when engine is used for emergencies	Y	10/19/13
63.6640(f)(1)(ii)	Operation of engine for maintenance checks and readiness testing limited to 100 hours per year	Y	10/19/13
63.6640(f)(1)(iii)	Operation of engine for non-emergency and not associated with maintenance checks and readiness testing is limited to 50 hours, which is counted towards the 100 hours per year maximum specified in 63.6640(f)(1)(ii)	Y	10/19/13
63.6645(a)(5)	The notification requirements of 63.6645(a) do not apply to this engine.	Y	10/19/13
63.6655	Record Keeping 1. Record hours of operation 2. Install non-resettable hour meter	Y	10/19/13
63.6660	Instructions for Records	Y	10/19/13
63.6670	Implementation and enforcement of Subpart ZZZZ	Y	10/19/13
<b>BAAQMD Condition # 21597</b>			
Part 1	Hours of Operation (9-8-232)	N	
Part 2	Fuel or Hours of Operation Meter (9-8-530)	N	
Part 3	Records (9-8-530)	N	

#### IV. Source-specific Applicable Requirements

**Table IV-E**  
**Source-specific Applicable Requirements**  
**S-8, COOLING TOWER**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
<b>BAAQMD Regulation 6, Rule 1</b>	<b>Particulate Matter, General Requirements (12/5/07)</b>		
6-1-301	Ringelmann Number 1 Limitation	N	
6-1-305	Visible Particles	N	
6-1-310	Particulate Weight Limitation	N	
6-1-401	Appearance of Emissions	N	
<b>SIP Regulation 6</b>	<b>Particulate Matter and Visible Emissions (9/4/98)</b>		
6-301	Ringelmann Number 1 Limitation	Y	
6-305	Visible Particles	Y	
6-310	Particulate Weight Limitation	Y	
6-401	Appearance of Emissions	Y	



## **V. SCHEDULE OF COMPLIANCE**

The permit holder shall comply with all applicable requirements cited in this permit. The permit holder shall also comply with applicable requirements that become effective during the term of this permit on a timely basis.

## VI. PERMIT CONDITIONS

### Condition #16676

#### For All Sources:

Any condition that is preceded by an asterisk is not federally enforceable.

#### Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen minute increments.
MM BTU:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 21(b) and 21(d).
Steam Turbine Cold Start-up:	The lesser of the first 360 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 21(b) and 21(d), following a steam turbine shutdown of at least 72 hours.
Gas Turbine Shutdown Mode:	The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Parts 21(a) through 21(f) until termination of fuel flow to the Gas Turbine.
Auxiliary Boiler Start-up:	The lesser of the first 120 minutes of continuous fuel flow to an Auxiliary Boiler after fuel flow is initiated; or the period of time from fuel flow initiation until the Boiler achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 28(b) and 28(d).

## VI. Permit Conditions

- Auxiliary Boiler Shutdown:** The lesser of the 30 minute period immediately prior the termination of fuel flow to the Auxiliary Boiler; or the period of time from non-compliance with any requirement listed in Parts 28(a) through 28(d) until termination of fuel flow to the auxiliary boiler.
- Specified PAHs:** The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds.
- Benzo[a]anthracene
  - Benzo[b]fluoranthene
  - Benzo[k]fluoranthene
  - Benzo[a]pyrene
  - Dibenzo[a,h]anthracene
  - Indeno[1,2,3-cd]pyrene
- Corrected Concentration:** The concentration of any pollutant (generally NO<sub>x</sub>, CO, or NH<sub>3</sub>) corrected to a standard stack gas oxygen concentration. For emission point P-1 (Gas Turbine S-1 and HRSG S-2) and emission point P-2 (Gas Turbine S-3 and HRSG S-4) the standard stack gas oxygen concentration is 15% O<sub>2</sub> by volume on a dry basis. For emission point P-3 (Auxiliary Boiler S-5), the standard stack gas oxygen concentration is 3% O<sub>2</sub> by volume on a dry basis.
- Combustor Tuning Activities:** All testing, adjustment, tuning, and calibration activities recommended by the gas turbine manufacturer to insure safe and reliable steady-state operation of the gas turbines following replacement of the combustor. This includes, but is not limited to, adjusting the amount of fuel distributed between the combustion turbine's staged fuel systems to simultaneously minimize NO<sub>x</sub> and CO production while minimizing combustor dynamics and ensuring combustor stability.
- Combustor Tuning Period:** The cumulative period, not to exceed 360 minutes, during which combustor tuning activities are taking place
- Precursor Organic Compounds (POCs):** Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate
- CEC CPM:** California Energy Commission Compliance Program Manager

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12. Deleted Application 10470
13. Deleted Application 10470

### **Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs) (S-2 & S-4).**

14. The Gas Turbines (S-1 and S-3) and HRSGs (S-2 and S-4) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-1, S-2, S-3, and S-4 shall sample and analyze the gas from each supply source at least once per month to determine the sulfur content of the gas. (BACT for SO<sub>2</sub> and PM<sub>10</sub>)
15. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 2,225.1 MM BTU per hour, averaged over any rolling 3-hour period. (PSD for NO<sub>x</sub>)
16. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 50,738.24 MM BTU per calendar day. (PSD for PM<sub>10</sub>)
17. The combined cumulative heat input rate for both Gas Turbines (S-1 and S-3) and both HRSGs (S-2 and S-4) shall not exceed 34,010,400 MM BTU per year. (Offsets)
18. The HRSG duct burners shall not be fired unless its associated Gas Turbine is in operation. (BACT for NO<sub>x</sub>, CO, POC)

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19. The Gas Turbine (S-1) and HRSG (S-2) shall be abated by the properly operated and properly maintained Oxidizing Catalyst (A-2) and Selective Catalytic Reduction System (A-1), in series. (BACT for NO<sub>x</sub> and CO)
20. The Gas Turbine (S-3) and HRSG (S-4) shall be abated by the properly operated and properly maintained Oxidizing Catalyst (A-4) and Selective Catalytic Reduction System (A-3), in series. (BACT for NO<sub>x</sub> and CO)
21. The owner/operator of the Gas Turbines (S-1 and S-3) and HRSGs (S-2 and S-4) shall meet all of the requirements listed in (a) through (h) below, except during a Gas Turbine Start-up, a Gas Turbine Shutdown, a steam turbine cold start-up, or a gas turbine combustor tuning period. (BACT, PSD, and Toxic Risk Management Policy)
  - (a) Nitrogen oxide emissions at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after control by the A-1 SCR System and A-2 Oxidation Catalyst) shall not exceed 20 pounds per hour, calculated as NO<sub>2</sub>, nor 0.009 lbs/MM BTU of natural gas fired. Nitrogen oxide emissions at P-2 (the combined exhaust point for the S-3 Gas Turbine and the S-4 HRSG after control by the A-3 SCR System and A-4 Oxidation Catalyst) shall not exceed 20 pounds per hour, calculated as NO<sub>2</sub>, nor 0.009 lbs/MM BTU of natural gas fired. (PSD for NO<sub>x</sub>)
  - (b) The nitrogen oxide concentration at P-1 and P-2 each shall not exceed 2.5 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any 1-hour period. (BACT for NO<sub>x</sub>)
  - (c) Carbon monoxide emissions at P-1 and P-2 each shall not exceed 29.2 pounds per hour, nor 0.0132 lb/MM BTU of natural gas fired. (PSD for CO)
  - (d) The carbon monoxide concentration at P-1 and P-2 each shall not exceed 6 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for CO)
  - \*(e) Ammonia (NH<sub>3</sub>) emissions at P-1 and P-2 each shall not exceed 10 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous records of the ammonia injection rate to A-1 and A-3 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-3 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit part 38. (REGULATION 2, RULE 5 for NH<sub>3</sub>)
  - (f) Precursor organic compound (POC) emissions at P-1 and P-2 each shall not exceed 3.8 pounds per hour, nor 0.0017 lb/MM BTU of natural gas fired. (BACT for POC)
  - (g) Sulfur dioxide (SO<sub>2</sub>) mass emissions at P-1 and P-2 each shall not exceed 6.2 pounds per hour or 0.00277 lb/MM BTU of natural gas fired. (BACT for SO<sub>2</sub>)
  - (h) Particulate matter (PM<sub>10</sub>) mass emissions at P-1 and P-2 each shall not exceed 9.0 pounds per hour or 0.0040 lb/MM BTU of natural gas fired. (BACT for PM<sub>10</sub>)

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23. The pollutant emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or shutdown or during a gas turbine combustor tuning period shall not exceed the limits established below. (PSD)

	<u>Start-Up (lb/start-up)</u>	<u>Shutdown (lb/shutdown)</u>	<u>Steam Turbine Cold Start-up or Combustor Tuning Period (lb/start-up or lb/period)</u>
(a) Oxides of Nitrogen (as NO <sub>2</sub> )	240	20	600
(b) Carbon Monoxide (CO)	2514	44.1	2514
(c) Precursor Organic Compounds (as CH <sub>4</sub> )	48	8	96

Within three months of the end of the Commissioning period, the owner/operator shall submit a plan designed to minimize emissions during the transient conditions encountered during gas turbine start-ups and shutdowns. This plan shall indicate what steps will be taken to start controlling NO<sub>x</sub> emissions as soon as feasible, including when ammonia can be fed to the SCR system without producing ammonia slip in excess of 10 ppmvd @ 15% O<sub>2</sub>. This plan shall be based upon the experience gathered from the source tests performed per part #13 and actual operating experience gained during the first six-months of operation. This plan shall also be developed in consultation with the manufacturers of the gas turbines, HRSGs, control systems, and air pollution control units. This plan shall be submitted to the CEC CPM for approval. After the plan has been approved, the owner/operator shall use the procedures included in the plan to minimize NO<sub>x</sub> emissions during gas turbine start-ups and shutdowns.

Within 24 months of the end of the Commissioning period, the owner/operator shall submit a report to the District and the CEC CPM that establishes reasonable maximum hourly mass emission rates for start-up and shutdown conditions. The revised mass emission rates shall be based upon source test and continuous emission monitoring data. Pending approval of the District and the CEC CPM, these revised mass emission rates shall be established as new emission limitations that will supersede the limits included in this part.

24. No more than one of the Gas Turbines (S-1 and S-3) shall be in start-up mode, supporting a steam turbine cold start-up, or undergoing combustor tuning at any point in time. The total number of hours during which the Gas Turbines (S-1 and S-3) may be operated to support a steam turbine cold start-up or may undergo combustor tuning shall not exceed 30 hours per year per gas turbine. (PSD)

## VI. Permit Conditions

### Conditions for the Auxiliary Boiler (S-5)

25. The Auxiliary Boiler (S-5) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-5 shall sample and test the gas from each supply source at least once per month to determine the sulfur content of the gas. (BACT for SO<sub>2</sub> and PM<sub>10</sub>)
26. The heat input rate to the Auxiliary Boiler (S-5) shall not exceed 320 million BTU per hour, averaged over any rolling 3-hour period. (Cumulative Increase)
27. The cumulative heat input rate to the Auxiliary Boiler (S-5) shall not exceed 480,000 million BTU per year. (Cumulative Increase)
28. The owner/operator of the Auxiliary Boiler (S-5) shall meet all of the requirements listed in (a) through (h) below, except during an Auxiliary Boiler Start-up or an Auxiliary Boiler Shutdown. (BACT, PSD)
  - (a) Nitrogen oxide emissions at P-3 (the exhaust point for the Auxiliary Boiler) shall not exceed 3.5 pounds per hour, calculated as NO<sub>2</sub>. (PSD for NO<sub>x</sub>)
  - (b) The nitrogen oxide concentration at P-3 shall not exceed 9.0 ppmv, measured as NO<sub>x</sub>, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for NO<sub>x</sub>)
  - (c) Carbon monoxide emissions at P-3 shall not exceed 11.8 pounds per hour. (PSD for CO)
  - (d) The carbon monoxide concentration at P-3 shall not exceed 50 ppmv, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for CO)
  - (e) Precursor organic compound (POC) emissions at P-3 shall not exceed 1.7 pounds per hour. (BACT for POC)
  - (f) Sulfur dioxide (SO<sub>2</sub>) mass emissions at P-3 shall not exceed 0.5 pounds per hour. (BACT for SO<sub>2</sub>)
  - (g) Particulate matter (PM<sub>10</sub>) mass emissions at P-3 shall not exceed 1.6 pounds per hour. (BACT for PM<sub>10</sub>)
  - \* (h) Ammonia (NH<sub>3</sub>) emissions at P-3 shall not exceed 10 ppmv, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. This ammonia concentration shall be verified by the continuous recording of the ammonia injection rate at the A-5 SCR System. The correlation between the auxiliary boiler heat input rate, A-5 SCR System ammonia injection rate, and corresponding ammonia emission concentration at P-3 shall be determined in accordance with permit part 38. (Regulation 2, Rule 5)

## VI. Permit Conditions

29. The Auxiliary Boiler (S-5), its burners, combustion chamber, and exhaust system shall be designed and constructed so that the boiler can be retrofitted with an oxidizing catalyst in the event the Auxiliary Boiler cannot consistently comply with the emission limitations specified in part 28. S-5 Auxiliary Boiler shall be abated by the properly operating and maintained A-5 Selective Catalytic Reduction System. (BACT for NO<sub>x</sub>, CO)

### Conditions for All Sources (S-1, S-2, S-3, S-4, and S-5)

30. The combined heat input rate to the Gas Turbines (S-1 and S-3), HRSGs (S-2 and S-4), and Auxiliary Boiler (S-5) shall not exceed 109,157 million BTU per calendar day. (PSD, CEC Offsets)
31. The cumulative heat input rate to the Gas Turbines (S-1 and S-3), HRSGs (S-2 and S-4), and Auxiliary Boiler (S-5) combined shall not exceed 34,490,400 million BTU per year. (Offsets)
32. Total combined emissions from the Gas Turbines, HRSGs, and Auxiliary Boiler (S-1, S-2, S-3, S-4, and S-5), including emissions generated during Gas Turbine Start-ups, Gas Turbine Shutdowns, Auxiliary Boiler Start-ups, and Auxiliary Boiler Shutdowns, shall not exceed the following limits during any calendar day:
- |     |  |        |
|-----|--|--------|
| (a) | 1342 pounds of NO <sub>x</sub> (as NO <sub>2</sub> ) per day | (CEQA) |
| (b) | 6445 pounds of CO per day                                    | (PSD)  |
| (c) | 271.3 pounds of POC (as CH <sub>4</sub> ) per day            | (CEQA) |
| (d) | 465 pounds of PM <sub>10</sub> per day                       | (PSD)  |
| (e) | 282.6 pounds of SO <sub>2</sub> per day                      | (BACT) |
33. Cumulative emissions from the Gas Turbines, HRSGs, and the Auxiliary Boiler combined (S-1, S-2, S-3, S-4, and S-5), including emissions generated during Gas Turbine Start-ups, Gas Turbine Shutdowns, Auxiliary Boiler Start-ups, and Auxiliary Boiler Shutdowns, shall not exceed the following limits during any consecutive twelve-month period:
- |     |  |                       |
|-----|--|-----------------------|
| (a) | 175.7 tons of NO <sub>x</sub> (as NO <sub>2</sub> ) per year | (Offsets, PSD)        |
| (b) | 506.4 tons of CO per year                                    | (Cumulative Increase) |
| (c) | 33.9 tons of POC (as CH <sub>4</sub> ) per year              | (Offsets)             |
| (d) | 69.2 tons of PM <sub>10</sub> per year                       | (Offsets, PSD)        |
| (e) | 47.11 tons of SO <sub>2</sub> per year                       | (Cumulative Increase) |



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\*34. The maximum projected annual toxic air contaminant emissions from the Gas Turbines, HRSGs, and the Auxiliary Boiler combined (S-1, S-2, S-3, S-4, and S-5) shall not exceed the following limits:

- (a) 3,817 pounds of formaldehyde per year
- (b) 460.9 pounds of benzene per year
- (c) 78.5 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) per year

unless the owner/operator meets the requirements of (d), (e), and (f) below:

- (d) The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District (District) approved procedures and unit risk factors in effect at the time of the analysis. The calculated excess cancer risk shall not exceed 1.0 in one million.
  - (e) The owner/operator shall perform a second risk analysis using the emission rates determined by source test and the procedures and unit risk factors in effect when the Determination of Compliance was issued. The calculated excess cancer risk shall not exceed 1.0 in one million.
  - (f) Both of these risk analyses shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will satisfy the conditions stated in parts (d) and (e) above, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. The Title V operating permit shall be amended to reflect these adjustments. (Regulation 2, Rule 5)
35. The owner/operator shall demonstrate compliance with parts 15 through 18, 21(a) through 21(d), 23, 24, 26, 28(a) through 28(d), 32(a), 32(b), 33(a), and 33(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods and Gas Turbine Combustor Tuning Periods) for all of the following parameters:
- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 and S-2 combined, S-3 and S-4 combined, and S-5.
  - (b) Oxygen (O<sub>2</sub>) Concentrations, Nitrogen Oxides (NO<sub>x</sub>) Concentrations, and Carbon Monoxide (CO) Concentrations at each of the following exhaust points: P-1, P-2 and P-3.
  - (c) Ammonia injection rate at A-1 and A-3 SCR Systems

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock

## VI. Permit Conditions

hour. For each calendar day, the owner/operator shall calculate and record the total Firing Hours, the average hourly Fuel Flow Rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (d) Heat Input Rate for each of the following sources: S-1 and S-2 combined, S-3 and S-4 combined, and S-5.
- (e) Corrected NO<sub>x</sub> concentrations, NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1, P-2, and P-3.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in parts 35(d) and 35(e) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

- (f) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
- (g) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined, the Auxiliary Boiler, and all five sources (S-1, S-2, S-3, S-4, and S-5) combined.
- (h) the average NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), CO mass emissions, and corrected NO<sub>x</sub> and CO emission concentrations for every clock hour and for every rolling 3-hour period.
- (i) on an hourly basis, the cumulative total NO<sub>x</sub> mass emissions (as NO<sub>2</sub>) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, the Auxiliary Boiler, and all five sources (S-1, S-2, S-3, S-4, and S-5) combined.
- (j) For each calendar day, the average hourly Heat Input Rates, Corrected NO<sub>x</sub> emission concentrations, NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined and the Auxiliary Boiler.
- (k) on a daily basis, the cumulative total NO<sub>x</sub> mass emissions (as NO<sub>2</sub>) and cumulative total CO mass emissions, for each calendar year for all five sources (S-1, S-2, S-3, S-4, and S-5) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

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36. To demonstrate compliance with parts 23(c), 32(c) through 32(e), and 33(c) through 33(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM<sub>10</sub>) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO<sub>2</sub>) mass emissions from each power train and the auxiliary boiler. The owner/operator shall use the actual Heat Input Rates calculated pursuant to part 35, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, actual steam turbine cold start-up times, actual gas turbine combustor tuning times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:
- (a) For each calendar day, POC, PM<sub>10</sub>, and SO<sub>2</sub> Emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined); the Auxiliary Boiler; and the five sources (S-1, S-2, S-3, S-4, and S-5) combined.
  - (b) on a daily basis, the cumulative total POC, PM<sub>10</sub>, and SO<sub>2</sub> mass emissions, for each year for all five sources (S-1, S-2, S-3, S-4, and S-5) combined.

(Offsets, PSD, Cumulative Increase)

- \*37. To demonstrate compliance with Part 34, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 39,390,400 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of Heat Input) determined by any source test at the Gas Turbine, HRSG, or Auxiliary Boiler. (Regulation 2, Rule 5)
- \*38. Within 60 days of start-up of the LMEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 and P-3 to determine the corrected ammonia (NH<sub>3</sub>) emission concentration to determine compliance with part 21(e) and 28(h). The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-3 SCR System ammonia injection rate, and the corresponding NH<sub>3</sub> emission concentration at emission point P-1 or P-2 and the correlation between the heat input rate of the auxiliary boiler, A-5 SCR System ammonia injection rate, and the corresponding NH<sub>3</sub> emission concentration at emission point P-3. The source test shall be conducted over the expected operating range of the turbine (at a minimum, 60%, 80%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NO<sub>x</sub> emission reductions while maintaining ammonia slip levels. Continuing compliance with part 21(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (Regulation 2, Rule 5)
39. Within 60 days of start-up of the LMEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas

## VI. Permit Conditions

Turbine and associated Heat Recovery Steam Generator are operating at maximum load to determine compliance with Parts 21(a), (b), (c), (d), (f), (g), & (h) and while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Parts 21(c), (d), & (f) and to verify the accuracy of the continuous emission monitors required in part 35. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and emissions, methane, ethane, and particulate matter (PM<sub>10</sub>) emissions including condensable particulate matter. (BACT, offsets)

40. Within 60 days of start-up of the LMEC and on an annual basis thereafter, the owner/operator shall conduct a District approved source test on exhaust point P-3 while the Auxiliary Boiler (S-5) is operating at maximum allowable operating rates to determine compliance with the emission limitations of Part 28(a) through 28(g) and to verify the accuracy of the continuous emission monitors required in part 35. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and emissions, and particulate matter (PM<sub>10</sub>) emissions including condensable particulate matter. (BACT, offsets)
41. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM<sub>10</sub> emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 60 days of completing the tests. (BACT)
- \*42. Within 60 days of start-up of the LMEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Part 34. Unless the requirements of part 42(b) have been met, the owner/operator shall determine the formaldehyde, benzene, and Specified PAH emission rates (in pounds/MM BTU). If any of the above pollutants are not detected (below the analytical detection limit), the emission concentration for that pollutant shall be deemed to be one half (50%) of the detection limit concentration. (Regulation 2, Rule 5)
  - (a) The owner/operator shall calculate the maximum projected annual emission rate for each pollutant by multiplying the pollutant emission rate (in pounds/MM BTU; determined by source testing) by 34,490,400 MM BTU/year.

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- (b) If three consecutive biennial source tests demonstrate that the emission rates calculated pursuant to part (a) for any of the compounds listed below are less than the annual emission rates shown, then the owner/operator may reduce the frequency of future testing for that pollutant to once every five years.

Benzene	≤	221 pounds/year
Formaldehyde	≤	1,834 pounds/year
Specified PAH's	≤	38 pounds/year

(Regulation 2, Rule 5)

43. The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)
44. The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emissions, monitor excesses, breakdowns, etc.), source test and analytical records, emission calculation records, records of steam turbine cold start-ups and gas turbine combustor tuning, and records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)
45. The owner/operator shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)
46. The stack heights of the emission points P-1 and P-2 shall be at least 150 feet above mean sea level (approximately 138.8 feet above grade level at the stack base). The stack height of the emission point P-3 shall be at least 100.6 feet above mean sea level (approximately 88.6 feet above grade level at the stack base). (PSD, Regulation 2, Rule 5)
47. The Owner/Operator of LMEC shall maintain adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall comply with the Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval. (Regulation 1-501)

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48. Deleted Application 10470.
49. Deleted Application 10470.
50. Deleted Application 10470.
51. Deleted Application 10470.
52. Deleted Application 10470.
53. Deleted August, 2001.
54. The Owner/Operator shall submit a Preplanned Abatement Strategy as described in BAAQMD Regulation 4, Air Pollution Episode Plan, within 120 days after issuance of the Title V permit. After the plan has been approved by the APCO, the owner/operator shall keep records of implementation on an event basis. (Basis: BAAQMD Regulation 4)
55. To demonstrate compliance with part 24, the owner/operator shall record the start time, end time, and duration of each steam turbine cold start-up and each gas turbine combustor tuning period. On an annual basis, the owner/operator shall submit a report to the District and the CEC CPM describing the total number of hours during which each turbine was operated in support of a steam turbine cold start-up or combustor tuning mode during the year. (PSD)

**Condition #22851 for:**  
**S-6 Fire Pump Diesel Engine**  
**COND# 22851**

1. Operating for reliability-related activities is limited to no more than 34 hours per year per engine which is the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25. This emergency fire pump is subject to the current National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems."  
  
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations]
2. The owner or operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited.

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[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(B)(3)]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1)]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
  - a. Hours of operation for reliability-related activities (maintenance and testing).
  - b. Hours of operation for emission testing to show compliance with emission limits.
  - c. Hours of operation (emergency).
  - d. For each emergency, the nature of the emergency condition.
  - e. Fuel usage for each engine(s).

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), (or, Regulation 2-6-501)]

5. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply: The owner or operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:
  - a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
  - b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session. "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e)(2)(B)(2)]

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### Condition #21597

#### For S-7, Natural-Gas Fired Emergency Generator

1. Hours of Operation: The owner/operator shall operate the emergency standby engine(s) only to mitigate emergency conditions or for reliability-related activities. Operation of the engine for the purpose of mitigating emergency conditions is unlimited. Operation of the engine for the purpose of reliability-related activities is limited to 100 hours per calendar year. (Basis: 9-8-330)

"Emergency Conditions" are defined as any of the following:

- a. Loss of regular natural gas supply
- b. Failure of regular electric power supply
- c. Flood mitigation
- d. Sewage overflow mitigation
- e. Fire
- f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor

(Basis: 9-8-231)

"Reliability-related activities" are defined as any of the following:

- a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
- b. Operation of an emergency standby engine during maintenance of a primary motor.

(Basis: 9-8-232)

2. The owner/operator shall equip the emergency standby engine with either:
  - a. a non-resettable totalizing meter that measures the hours of operation for the engine; or
  - b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

(Basis: 9-8-530)

3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 25 years and shall make the log available for District inspection upon request:
  - a. Hours of operation (total)
  - b. Hours of operation (emergency)
  - c. For each emergency, the nature of the emergency condition
  - d. Fuel usage for engine(s) if a non-resettable fuel usage meter is utilized

(Basis: 9-8-530)



## VII. APPLICABLE LIMITS & COMPLIANCE MONITORING REQUIREMENTS

This section has been included to summarize the applicable emission limits contained in Section IV, Source-Specific Applicable Requirements, of this permit. The following tables show the relationship between each emission limit and the associated compliance monitoring provisions, if any. The monitoring frequency indicates whether periodic (P) or continuous (C) monitoring is required. For periodic monitoring, the frequency of the monitoring has also been shown, using the following codes: annual (A), quarterly (Q), monthly (M), weekly (W), daily (D), or on an event basis (E). No monitoring (N) has been required if the current applicable rule or regulation does not require monitoring, and the operation is unlikely to deviate from the applicable emission limit based upon the nature of the operation.

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
NO <sub>x</sub>	BAAQMD 9-3-303	N		125 ppm	BAAQMD 1-520.1	C	CEM
	BAAQMD 9-9-301.2	N		0.15 lb/MW-hr or 5 ppmv	BAAQMD 9-9-501	C	CEM
NO <sub>x</sub>	SIP 9-9-301.3	Y		9 ppmv @ 15% O <sub>2</sub> , dry	BAAQMD 9-9-501	C	CEM
	NSPS 40 CFR 60.44Da (a)(1)	Y		0.2 lb/MMBtu	40 CFR 60.48Da(j)	C	CEM
NO <sub>x</sub>	NSPS 40 CFR 60.44Da (d)(1)	Y		1.6 lb/MW-hr (rolling 24-hr average)	40 CFR 60.48Da(k),	C	CEM
	NSPS, 40 CFR 60.332 (a)(1)	Y		75 ppmv, @ 15% O <sub>2</sub> , dry 4-hr average	40 CFR 60.334(c) and BAAQMD Condition 16676, Part 35b	C	CEM
		Y		None	40 CFR 75.10	C	CEM

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
NO <sub>x</sub>	BAAQMD condition #16676, part 21a	Y		20 lb/hr, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM
NO <sub>x</sub>	BAAQMD condition #16676, part 21a	Y		20 lb/hr, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum load
	BAAQMD condition #16676, part 21a	Y		0.009 lb/MM BTU, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 21a	Y		0.009 lb/MM BTU, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum load
	BAAQMD condition #16676, part 21b	Y		2.5 ppmv, @ 15% O <sub>2</sub> , dry, for each turbine and HRSG combined, 1-hr average except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
	BAAQMD condition #16676, part 21b	Y		2.5 ppmv, @ 15% O <sub>2</sub> , dry, for each turbine and HRSG combined, 1-hr average except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum load
NO <sub>x</sub>	BAAQMD condition #16676, part 23(a)	Y		240 lb/turbine during start-up	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 23(a)	Y		20 lb/turbine during shutdown	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 23(a)	Y		600 lb/turbine during steam turbine cold start-up or combustor tuning period	BAAQMD condition #16676, part 36	P/D	Records, calculations
NO <sub>x</sub>	BAAQMD condition #16676, part 32a	Y		1342 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 33a	Y		175.7 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 35b	C	CEM

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
CO	BAAQMD condition #16676, part 21c	Y		29.2 lb/hr, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM
CO	BAAQMD condition #16676, part 21c	Y		29.2 lb/hr, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
	BAAQMD condition #16676, part 21c	Y		0.0132 lb/MM BTU, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 21c	Y		0.0132 lb/MM BTU, for each turbine and HRSG combined, except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
CO	BAAQMD condition #16676, part 21d	Y		6 ppmv, @ 15% O <sub>2</sub> , dry, for each turbine and HRSG combined, 3-hr average except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 35b	C	CEM

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
CO	BAAQMD condition #16676, part 21d	Y		6 ppmv, @ 15% O <sub>2</sub> , dry, for each turbine and HRSG combined, 3-hr average except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
CO	BAAQMD condition #16676, part 23(b)	Y		2514 lb/turbine during start-up, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 36	P/D	Records, calculations
CO	BAAQMD condition #16676, part 23(b)	Y		44.1 lb/turbine during shutdown	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 32b	Y		6445 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35b	C	CEM
CO	BAAQMD condition #16676, part 33b	Y		506.4 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 35b	C	CEM
CO <sub>2</sub>		Y		None	40 CFR 75.10	C	fuel flow monitor and CO <sub>2</sub> calculation
SO <sub>2</sub>	BAAQMD 9-1-301	Y		GLC <sup>1</sup> of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours		N	
	BAAQMD 9-1-302	Y		300 ppm (dry)		N	

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
SO <sub>2</sub>	NSPS 40 CFR 60.43Da (b)(2)			0.2 lb/MM BTU, 24 hr average except during startup, shutdown		N	
SO <sub>2</sub>	NSPS 40 CFR 60.333	Y		0.015% (vol) @15% O <sub>2</sub> (dry) or total sulfur content of fuel less than or equal to 0.8% sulfur by weight (8,000 ppmw)l	NSPS 40 CFR 60.334(h)(3) (ii) and BAAQMD Condition 16676, Part 14	P/M	Monthly fuel sulfur analysis
		Y		None	40 CFR 75.11, 40 CFR 75, Appendix D, part 2.3		Fuel measurements, calculations
	BAAQMD condition #16676, part 14	Y		Fuel sulfur content of 1 gr/100 scf	BAAQMD condition #16676, part 14	P/M	Fuel testing
	BAAQMD condition #16676, part 21g	Y		6.2 lb/hr, for turbine and HRSG combined	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
SO <sub>2</sub>	BAAQMD condition #16676, part 21g	Y		0.00277 lb/MM BTU, for turbine and HRSG combined	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
SO <sub>2</sub>	BAAQMD condition #16676, part 32e	Y		282.6 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 33e	Y		47.11 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
Opacity	BAAQMD 6-1-301	N		> Ringelmann No. 1 for no more than 3 minutes in any hour		N	
Opacity	SIP 6-301	Y		> Ringelmann No. 1 for no more than 3 minutes in any hour		N	
Opacity	NSPS 40 CFR 60.42Da(b)	Y		20% Opacity (6 min avg.) with one 6 min avg. at less than 27% Opacity	40 CFR 60.49Da(a) (3) <sup>2</sup>	N	
FP	BAAQMD 6-1-310	N		0.15 grain/dscf		N	
FP	SIP 6-310	Y		0.15 grain/dscf		N	
FP	BAAQMD 6-1-310.3	N		0.15 grain/dscf @ 6% O <sub>2</sub>		N	
	SIP6-310.3	Y		0.15 grain/dscf @ 6% O <sub>2</sub>		N	
PM	NSPS 40 CFR 60.42Da (a)(1)	Y		0.03 lb/MMBtu of PM		N	

<sup>2</sup> The EPA has recently promulgated changes to Subpart Da in direct final rule action (Federal Register, January 20, 2011) allowing the permitting authority to exempt owners/operators of affected facilities burning only natural gas from the opacity monitoring requirements contained in 60.49Da(a)(3). The District is exempting the facility from the opacity monitoring requirement contained in 60.49Da(a)(3).

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
PM	NSPS 40 CFR 60.42Da(b)	Y		< 20% opacity, 6 minute average, except one six minute period/hr up to 27% opacity		N	
PM <sub>10</sub>	BAAQMD condition #16676, part 21h	Y		9.0 lb/hr, for each turbine and HRSG combined	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
PM <sub>10</sub>	BAAQMD condition #16676, part 21h	Y		0.0040 lb/MMBTU, for each turbine and HRSG combined	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
	BAAQMD condition #16676, part 32d	Y		465 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
PM <sub>10</sub>	BAAQMD condition #16676, part 33d	Y		69.2 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
POC	BAAQMD condition #16676, part 21f	Y		3.8 lb/hr (as CH <sub>4</sub> ) for each turbine, and HRSG combined except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load



## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
POC	BAAQMD condition #16676, part 21f	Y		0.0017 lb/MM BTU (as CH <sub>4</sub> ) for each turbine, and HRSG combined except during turbine startup, shutdown, steam turbine cold start-up, or combustor tuning period	BAAQMD condition #16676, part 39	P/A	Source test at maximum and minimum load
	BAAQMD condition #16676, part 23(c)	Y		48 lb/turbine during start-up	BAAQMD condition #16676, part 36	P/D	Records, calculations
POC	BAAQMD condition #16676, part 23(c)	Y		8 lb/turbine during shutdown	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 23(c)	Y		96 lb/turbine during steam turbine cold start-up or combustor tuning period	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 32c	Y		271.3 lb/day (as CH <sub>4</sub> ) for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
POC	BAAQMD condition #16676, part 33c	Y		33.9 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
NH <sub>3</sub>	BAAQMD condition #16676, Part 21e	N		10 ppmv, @ 15% O <sub>2</sub> , dry, averaged over 3 hrs for each turbine and HRSG combined except during turbine startup or shutdown	BAAQMD condition #16676, part 35c	C	Ammonia injection rate monitor

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
NH <sub>3</sub>	BAAQMD condition #16676, Part 21e	N		10 ppmv, @ 15% O <sub>2</sub> , dry, averaged over 3 hrs for each turbine and HRSG combined except during turbine startup or shutdown	BAAQMD condition #16676, part 21e	C	Ammonia injection rate monitor
Formaldehyde	BAAQMD condition #16676, part 34a	N		3817 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 34a	N		3817 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 42	P/every two years on P-1 or P-2	Source test
Benzene	BAAQMD condition #16676, part 34a	N		460.9 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 34a	N		460.9 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 42	P/every two years on P-1 or P-2	Source test
Specified PAH's	BAAQMD condition #16676, Part 34c	N		78.5 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, Part 34c	N		78.5 lb/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 42	P/every two years on P-1 or P-2	Source test
Heat input limit	BAAQMD condition #16676, part 15	Y		2,225.1 MM BTU/hr, 3-hr average for each Turbine and HRSG, total	BAAQMD condition #16676, part 35a	C	Fuel meter, firing monitor, calculations

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – A**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-1, S-3 GAS TURBINE**  
**S-2, S-4 HEAT RECOVERY STEAM GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Heat Input Limit	BAAQMD condition #16676, part 16	Y		50,738.24 MM BTU/calendar day, for each Turbine and HRSG, total	BAAQMD condition #16676, part 35a	C	fuel meter, firing monitor, calculations
	BAAQMD condition #16676, part 17	Y		34,010,400 MM BTU/yr for S-1, S-3, Turbines and S-2, S-4, HRSGs combined	BAAQMD condition #16676, part 35a	C	fuel meter, firing monitor, calculations
Heat input limit	BAAQMD condition #16676, part 30	Y		109,157 MM BTU/day, for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35a	C	Fuel meters
	BAAQMD condition #16676, part 31	Y		34,490,400 MM BTU/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35a	C	Fuel meters
Steam turbine cold start-up or combustor tuning	BAAQMD condition #16676, part 24	Y		30 hours per year per turbine	BAAQMD condition #16676, part 55	P/H	records

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII - B**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-5, AUXILIARY BOILER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
NO <sub>x</sub>	BAAQMD 9-3-303	N		125 ppm	BAAQMD 1-520.1	C	CEM
	BAAQMD 9-7-301.1	N		30 ppmv @3%O <sub>2</sub> , dry	BAAQMD 1-520.1	C	CEM
	SIP 9-7-301.1	Y		30 ppmv @3%O <sub>2</sub> , dry	BAAQMD 1-520.1	C	CEM
NO <sub>x</sub>	NSPS 40 CFR 60.44b (a)(4)	Y		0.2 lb/MM BTU, 30-day rolling average in NSPS, 24 averaging period per BAAQMD Regulation 10, part 4)	NSPS 40 CFR 60.48b(b) and Condition No. 16676 Part 35b	C	CEM
	BAAQMD condition #16676, part 28a	Y		3.5 lb/hr except during startup or shutdown	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 28b	Y		9.0 ppmv @ 3% O <sub>2</sub> , 3-hr average	BAAQMD condition #16676, part 35b	C	CEM
NO <sub>x</sub>	BAAQMD condition #16676, part 32a	Y		1342 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35b	C	CEM
NO <sub>x</sub>	BAAQMD condition #16676, part 33a	Y		175.7 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 35b	C	CEM
CO	BAAQMD 9-7-301.4	N		400 ppmv @ 3% O <sub>2</sub> , dry	BAAQMD condition #16676, part 35(b)	C	CEM

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII - B**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-5, AUXILIARY BOILER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
CO	SIP 9-7-301.2	Y		400 ppmv @ 3% O <sub>2</sub> , dry	BAAQMD condition #16676, part 35(b)	C	CEM
	BAAQMD condition #16676, part 28c			11.8 lb/hr except during startup or shutdown	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 28d			50 ppmv @ 3% O <sub>2</sub> , 3-hr average	BAAQMD condition #16676, part 35b	C	CEM
	BAAQMD condition #16676, part 32b	Y		6445 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35b	C	CEM
CO	BAAQMD condition #16676, part 33b	Y		506.4 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 35b	C	CEM
SO <sub>2</sub>	BAAQMD 9-1-301	Y		GLC <sup>1</sup> of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours		N	
SO <sub>2</sub>	BAAQMD 9-1-302	Y		300 ppm (dry)		N	
SO <sub>2</sub>	BAAQMD condition #16676, part 25	Y		Fuel sulfur content of 1 gr/100 scf	BAAQMD condition #16676, part 25	P/M	Fuel testing
	BAAQMD condition #16676, part 28f	Y		0.5 lb/hr	BAAQMD condition #16676, part 40	P/A	Source test at maximum load

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII - B**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-5, AUXILIARY BOILER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
SO <sub>2</sub>	BAAQMD condition #16676, part 32e	Y		282.6 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 33e	Y		47.11 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
Opacity	BAAQMD 6-1-301	N		> Ringelmann No. 1 for no more than 3 minutes in any hour		N	
Opacity	SIP 6-301	Y		> Ringelmann No. 1 for no more than 3 minutes in any hour		N	
Opacity	BAAQMD 6-1-304	N		During tube cleaning, Ringelmann No. 2 for 3 min/hr and 6 min/billion btu/24 hours		N	
Opacity	SIP 6-304	Y		During tube cleaning, Ringelmann No. 2 for 3 min/hr and 6 min/billion btu/24 hours		N	
FP	BAAQMD 6-1-310	N		0.15 grain/dscf		N	
FP	SIP 6-310	Y		0.15 grain/dscf		N	
FP	BAAQMD 6-1-310.3	N		0.15 grain/dscf @ 6% O <sub>2</sub>		N	
FP	SIP 6-310.3	Y		0.15 grain/dscf @ 6% O <sub>2</sub>		N	

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII - B**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-5, AUXILIARY BOILER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
PM <sub>10</sub>	BAAQMD condition #16676, part 28g	Y		1.6 lb/hr	BAAQMD condition #16676, part 40	P/A	Source test at maximum load
PM <sub>10</sub>	BAAQMD condition #16676, part 32d	Y		465 lb/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
	BAAQMD condition #16676, part 33d	Y		69.2 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
POC	BAAQMD condition #16676, part 28e	Y		1.7 lb/hr (as CH <sub>4</sub> )	BAAQMD condition #16676, part 40	P/A	Source test
POC	BAAQMD condition #16676, part 32c	Y		271.3 lb/day (as CH <sub>4</sub> ) for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 36	P/D	Records, calculations
POC	BAAQMD condition #16676, part 33c	Y		33.9 ton/yr for turbines, HRSGs, and boiler combined (includes emissions from commissioning period)	BAAQMD condition #16676, part 36	P/D	Records, calculations
NH <sub>3</sub>	BAAQMD condition #16676, Part 28h	N		10 ppmv, @ 3% O <sub>2</sub> , dry, averaged over 3 hrs	BAAQMD condition #16676, part 28h	C	Records of ammonia injection rate
Heat input limits	BAAQMD condition #16676, part 26	Y		320 MM BTU/hr, 3-hr average	BAAQMD condition #16676, part 35a	C	fuel meter, firing monitor, calculations

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII - B**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-5, AUXILIARY BOILER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
	BAAQMD condition #16676, part 27	Y		480,000 MM BTU/yr	BAAQMD condition #16676, part 35a	C	Fuel meters
Heat input limits	BAAQMD condition #16676, part 30			109,157 MM BTU/day for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35a	C	Fuel meters
	BAAQMD condition #16676, part 31	Y		34,490,400 MM BTU/yr for turbines, HRSGs, and boiler combined	BAAQMD condition #16676, part 35a	C	Fuel meters



## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – C**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-6, FIRE PUMP DIESEL ENGINE**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Opacity	BAAQMD 6-1-303.1	N		> Ringelmann No. 2 for no more than 3 minutes in any hour		N	
Opacity	SIP Regulation 6-303.1	Y		Ringelmann 2.0 for 3 minutes in any hour		N	
FP	BAAQMD 6-1-310	N		0.15 grain/dscf		N	
FP	SIP Regulation 6-310	Y		0.15 gr/dscf		N	
SO <sub>2</sub>	BAAQMD 9-1-301	Y		Property Line Ground Level Limits: ≤ 0.5 ppm for 3 minutes and ≤ 0.25 ppm for 60 min. and ≤ 0.05 ppm for 24 hours	None	N	N/A
SO <sub>2</sub>	BAAQMD 9-1-304	Y		Fuel Sulfur Limit 0.5%	BAAQMD Condition # 19498, Parts 5 and 8	P/E	Vendor Certification
Reliability Related Hours	BAAQMD 9-8-330	N	1/1/12	100 hours until 1/1/12 50 hours after 1/1/12	9-8-502	P/E	Totalizing meter record keeping
Reliability-related activities	BAAQMD Condition #22851, part 1	N		34 hours per calendar year	BAAQMD Condition #22851, part 3, 4	P/E	Totalizing meter, record-keeping

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – D**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-7, NATURAL GAS FIRED EMERGENCY GENERATOR**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Opacity	BAAQMD 6-1-303.1	N		< Ringelmann No. 2, except for no more than 3 minutes in any hour		N	
Opacity	SIP Regulation 6-303.1	Y		< Ringelmann No. 2, except for no more than 3 minutes in any hour		N	
FP	BAAQMD 6-1-310	N		0.15 grain/dscf		N	
FP	SIP Regulation 6-310	Y		0.15 gr/dscf		N	
SO <sub>2</sub>	BAAQMD Regulation 9-1-301	Y		Property Line Ground Level Limits: ≤ 0.5 ppm for 3 minutes and ≤ 0.25 ppm for 60 min. and ≤ 0.05 ppm for 24 hours		N	
Reliability Related Hours	BAAQMD 9-8-330	N	1/1/12	100 hours until 1/1/12 50 hours after 1/1/12	9-8-502	P/E	Totalizing meter record keeping
Reliability-related activities	BAAQMD Condition #21597, part 1	Y		100 hours per calendar year	BAAQMD Condition #21597, part 2 and 3	P/E	Record-keeping

## VII. Applicable Limits and Compliance Monitoring Requirements

**Table VII – E**  
**Applicable Limits and Compliance Monitoring Requirements**  
**S-8, COOLING TOWER**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Opacity	BAAQMD 6-1-301	N		≥ Ringelmann No. 1 for no more than 3 minutes in any hour		N	
Opacity	SIP 6-301	Y		> Ringelmann No. 1 for no more than 3 minutes in any hour		N	
FP	BAAQMD 6-1-310	N		0.15 grain/dscf		N	
FP	SIP 6-310	Y		0.15 grain/dscf		N	

## VIII. TEST METHODS

The test methods associated with the emission limit of a District regulation are generally referenced in Section 600 et seq. of the regulation. The following table indicates only the test methods associated with the emission limits referenced in Section VII, Applicable Emission Limits & Compliance Monitoring Requirements, of this permit.

**Table VIII**  
**Test Methods**

Applicable Requirement	Description of Requirement	Acceptable Test Methods
BAAQMD 6-1-301	Ringelmann No. 1 Limitation	Manual of Procedures, Volume I, Evaluation of Visible Emissions, or EPA Method 9
BAAQMD 6-1-304	Tube Cleaning	Manual of Procedures, Volume I, Evaluation of Visible Emissions, or EPA Method 9
BAAQMD 6-1-310	Particulate Weight Limitation	Manual of Procedures, Volume IV, ST-15, Particulates Sampling, or EPA Method 5, or EPA Method 201A, Determination of PM10 Emissions, plus EPA Method 202, Determination of Condensable Particulate Emissions from Stationary Sources
BAAQMD 9-1-302	General Emission Limitation	Manual of Procedures, Volume IV, ST-19A, Sulfur Dioxide, Continuous Sampling, or ST-19B, Total Sulfur Oxides Integrated Sample
BAAQMD 9-3-303	New or Modified Heat Transfer Operation Limits	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling, or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling
BAAQMD 9-7-301.1	Performance Standard, NO <sub>x</sub> , Gaseous Fuel	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling
BAAQMD 9-7-301.2	Performance Standard, CO, Gaseous Fuel	Manual of Procedures, Volume IV, ST-6, Carbon Monoxide, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling
BAAQMD 9-9-301.3	Emission Limits- Turbines Rated ≥ 10 MW w/SCR	Manual of Procedures, Volume IV, ST-13A, Oxides of Nitrogen, Continuous Sampling and ST-14, Oxygen, Continuous Sampling, or ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling

## VIII. Test Methods

**Table VIII**  
**Test Methods**

Applicable Requirement	Description of Requirement	Acceptable Test Methods
<b>NSPS</b>		
Subpart Da	Standards of Performance for Electric Utility Steam Generating Units for Which Construction Is Commenced after September 18, 1978	
60.42Da (a)(1)	Particulate Limit	EPA Method 5, Determination of Particulate Emissions from Stationary Sources
60.42Da (b)	Opacity Limit	EPA Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources
60.43Da (b)(2)	SO <sub>2</sub> limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
60.44Da (a)(1)	NO <sub>x</sub> limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	
60.44b (a)(4)	NO <sub>x</sub> Limit	EPA Method 19, Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates
Subpart GG	Standards of Performance for Stationary Gas Turbines	
60.332 (a)(1)	Performance Standard, NO <sub>x</sub>	EPA Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
60.333 (a)	SO <sub>2</sub> Volumetric Emission Limit	EPA Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
60.333 (b)	Fuel Sulfur Limit (gaseous fuel)	ASTM D 1072-80, Standard Method for Total Sulfur in Fuel Gases ASTM D 3031-81, Standard Test Method for Total Sulfur in Natural Gas by Hydrogenation

## VIII. Test Methods

**Table VIII**  
**Test Methods**

Applicable Requirement	Description of Requirement	Acceptable Test Methods
BAAQMD Condition #16676		
Part 21g	SOx Limit	Test Procedure, MOP Vol.4, ST-19A, Sulfur Dioxide, Continuous Sampling
Part 21b	NOx Limit	Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling
Part 21e	NH3 Limit	BAAQMD Test Procedure ST-1B, Ammonia, Integrated Sampling
Part 21d	CO Limit	Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling
Part 21f	POC Limit	Test Procedure ARB 100, Procedures for Continuous Gaseous Emission Stack Sampling
Part 21h	PM10 Limit	EPA Method 5, or EPA Method 201A, Determination of PM10 Emissions, plus EPA Method 202, Determination of Condensable Particulate Emissions from Stationary Sources
Part 34	Formaldehyde Limit	ARB Method 430, Determination of Formaldehyde and Acetaldehyde in Emissions from Stationary Sources
Part 34	Benzene Limit	ARB Method 410A, Determination of Benzene from Stationary Sources (Low Concentration Gas Chromatographic Technique), or EPA Method TO-15 Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS). EPA Method TO-15 is an ambient air method modified for use on a stationary source.
Part 34	Polycyclic Aromatic Hydrocarbons Limit	ARB Method 429, Determination of Polycyclic Aromatic Hydrocarbon (PAH) Emissions from Stationary Sources

## **IX. TITLE IV ACID RAIN PERMIT**

**Effective October 3, 2011 through October 2, 2016**

---

**ISSUED TO:**

Los Medanos Energy Center, LLC  
P. O. Box 551  
Pittsburg, CA 94565

**PLANT SITE LOCATION:**

750 East Third Street  
Pittsburg, CA 94565

**ISSUED BY:**

Signed by Jim Karas, P. E.

Jim Karas, P. E., Director of Engineering Division

October 26, 2015

Date

---

**Type of Facility:** Power Plant  
**Primary SIC:** 4911  
**Product:** Electricity

**DESIGNATED REPRESENTATIVE**

**Name:** Dale Donmoyer  
**Title:** General Manager  
**Phone:** (925) 252-2096

**ALTERNATE DESIGNATED REPRESENTATIVE:**

**Name:** Maria Barroso  
**Title:** EHS Specialist II  
**Phone:** (925) 252-8286

## IX. Title IV Acid Rain Permit

- 1) Statement of Basis
- 2) SO<sub>2</sub> allowance allocated under this permit and NO<sub>x</sub> requirements for each affected unit.
- 3) Comments, notes and justifications regarding permit decisions and changes made to the permit application forms during the review process, and any additional requirements of conditions.
- 4) The permit application submitted for this source. The owners and operators of the source must comply with the standard requirements and special provisions set forth in the application.

### 1) STATEMENT OF BASIS

**Statutory and regulatory Authorities:** In accordance with District Regulation 2, Rule 7 and Titles IV and V of the Clean Air Act, the Bay Area Air Quality Management District issues this permit pursuant to District Rule Regulation 2, Rule 7.

### 2) SO<sub>2</sub> ALLOWANCE ALLOCATIONS

	Year	2011	2012	2013	2014	2015
	SO <sub>2</sub> allowances under Table 2 of 40 CFR Part 73	None	None	None	None	None
S-1, Turbine	NO <sub>x</sub> Limit	This unit is not subject to the NO <sub>x</sub> requirements from 40 CFR Part 76 as this unit is not capable of firing on coal.				

	Year	2011	2012	2013	2014	2015
	SO <sub>2</sub> allowances under Table 2 of 40 CFR Part 73	None	None	None	None	None
S-2, Heat Recovery Steam Generator	NO <sub>x</sub> Limit	This unit is not subject to the NO <sub>x</sub> requirements from 40 CFR Part 76 as this unit is not capable of firing on coal.				



## IX. Title IV Acid Rain Permit

	Year	2011	2012	2013	2014	2015
	SO <sub>2</sub> allowances under Table 2 of 40 CFR Part 73	None	None	None	None	None
S-3, Turbine	NO <sub>x</sub> Limit	This unit is not subject to the NO <sub>x</sub> requirements from 40 CFR Part 76 as this unit is not capable of firing on coal.				

	Year	2011	2012	2013	2014	2015
	SO <sub>2</sub> allowances under Table 2 of 40 CFR Part 73	None	None	None	None	None
S-4, Heat Recovery Steam Generator	NO <sub>x</sub> Limit	This unit is not subject to the NO <sub>x</sub> requirements from 40 CFR Part 76 as this unit is not capable of firing on coal.				

### 3) COMMENTS, NOTES AND JUSTIFICATIONS

None

### 4) PERMIT APPLICATION

Attached

## **X. PERMIT SHIELD**

### **A. Non-applicable Requirements**

None.

### **B. Subsumed Requirements**

None.

## **XI. REVISION HISTORY**

Final Title V Permit Issuance (Application 2804): September 6, 2001

Significant Revision (Application 7081): January 13, 2004

Purpose: to increase the time allowed for a cold startup of a steam turbine from 180 minutes per event to 360 minutes per event and to allow the turbines to exceed the general NO<sub>x</sub> and CO limits during infrequent tune-ups.

Reopening (Application 10470): November 9, 2004

- Addition of Diesel Fire Pump (S-6) and Natural Gas Fired Emergency Generator (S-7)
- Addition of Cooling Tower (S-8)
- Addition of MW rating for duct burners, S-2 and S-4
- Addition of application shield language to Standard Condition I.B.1.
- Update of rule amendment dates throughout permit.
- Update of Section III, Generally Applicable Requirements
- Addition of requirements from Regulation 1-520 to S-1 and S-3, Turbines.
- Deletion of Regulation 6-401 from gas-fired equipment, S-1 through S-5.
- Addition of Regulation 9, Rule 3, Section 303 to Section IV and Section VII tables for S-1 and S-3, Turbines.
- Addition of Regulation 9, Rule 3, Section 303 to Section VII tables for S-2 and S-4, Duct Burners.
- Update of requirements in 40 CFR 60, Subpart GG, Stationary Gas Turbines.
- Correction of citations of requirements from 40 CFR 60, Subpart Db, Electric Utility Steam Generating Units for Which Construction Is Commenced after September 18, 1978
- Deletion of commissioning conditions
- Deletion of obsolete conditions
- Revision of permit shields
- Deletion of 40 CFR 75 from Section VII table for S5, Auxiliary Boiler

Administrative Amendment (Application. 12281),  
Minor Revision (Application. 14970):

June 2, 2008

- Revision of Natural Gas Sampling Frequency from once every 30 days to once per month.
- Decreased particulate emission limits based on actual source test data from facility.

## **XI. Revision History**

Title V Renewal Application No. 14296

October 3, 2011

- Added Standard Condition Text for I.B.1 and I.B.12.
- Updated regulatory requirements in Table III applicable requirements.
- Combined Table IV-B through D with Table IV-A for the gas turbines and heat recovery steam generators.
- Updated regulatory requirements in Table IV for the gas turbines and HRSGs.
- Change Permit Condition for S-6 Diesel Fire Pump from Condition No. 19399 to Condition No. 22851.

Title V Minor Revision Application No. 22860

February 28, 2013

- Changed the turbine output to 190 MW in Table II-A.
- Corrected typo in Table IV-A Condition 16676 Part 44 changed basis from Regulation 2-6-502 to 2-6-501.
- Corrected typo in Table VII-A. The NSPS NO<sub>x</sub> Limit monitoring requirement citation referred to Condition No. 17154 and this was corrected to Condition No. 16676.
- Updated Test Methods Table VIII.

Administrative Amendment Application No. 25536

July 15, 2013

- Change Responsible Official
- Change Facility Contact Job Title
- Add Alternate Responsible Official

Administrative Amendment (Application #27473)

October 26, 2015

- Change Facility Contact
- Delete alternate responsible officials on the current Title V permit.
- Change an alternate designated representative for Title IV Acid Rain Permit.
- Update EPA's address on Section I, G. of the permit

## **XII. GLOSSARY**

### **ACT**

Federal Clean Air Act

### **BAAQMD**

Bay Area Air Quality Management District

### **BACT**

Best Available Control Technology

### **CAA**

The federal Clean Air Act

### **CAAQS**

California Ambient Air Quality Standards

### **CEQA**

California Environmental Quality Act

### **CFR**

The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

### **CO**

Carbon Monoxide

### **Cumulative Increase**

The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Used to determine whether threshold-based requirements are triggered.

### **District**

The Bay Area Air Quality Management District

### **EPA**

The federal Environmental Protection Agency.

### **Excluded**

Not subject to any District regulations.

## **XII. Glossary**

### **Federally Enforceable, FE**

All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60, (NSPS), Part 61, (NESHAPs), Part 63 (HAP), and Part 72 (Permits Regulation, Acid Rain), including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

### **FP**

Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

### **HAP**

Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by both 40 CFR Part 63, and District Regulation 2, Rule 5.

### **HRSG**

Heat Recovery Steam Generator

### **Major Facility**

A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

### **MFR**

Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Federal Clean Air Act and implemented by District Regulation 2, Rule 6.

### **MOP**

The District's Manual of Procedures.

### **NAAQS**

National Ambient Air Quality Standards

### **NESHAPS**

National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63

### **NMHC**

Non-methane Hydrocarbons

## **XII. Glossary**

### **NO<sub>x</sub>**

Oxides of nitrogen.

### **NSPS**

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

### **NSR**

New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

### **Offset Requirement**

A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub>.

### **Phase II Acid Rain Facility**

A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

### **POC**

Precursor Organic Compounds

### **PM**

Particulate Matter

### **PM<sub>10</sub>**

Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

### **PSD**

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

## **XII. Glossary**

### **SIP**

State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

### **SO<sub>2</sub>**

Sulfur dioxide

### **Title V**

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

### **TSP**

Total Suspended Particulate

### **VOC**

Volatile Organic Compounds

### **Units of Measure:**

bhp	=	brake-horsepower
btu	=	British Thermal Unit
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m <sup>2</sup>	=	square meter
min	=	minute
mm	=	million
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year



### XIII. TITLE IV PERMIT APPLICATION



United States  
Environmental Protection Agency  
Acid Rain Program

OMB No. 2060-0236

## Acid Rain Permit Application

For more information, see instructions and refer to 40 CFR 72.30 and 72.31

This submission is: ☐ New ☒ Revised

#### STEP 1

Identify the source by  
plant name, State, and  
ORIS code.

Los Medanos Energy Center, LLC		
Plant Name	State CA	ORIS Code 55217

#### STEP 2

Enter the unit ID#  
for every affected  
unit at the affected  
source in column "a."  
For new units, enter the  
requested information in  
columns "c" and "d."

a	b	c	d
Unit ID#	Unit Will Hold Allowances In Accordance with 40 CFR 72.9(c)(1)	New Units Commence Operation Date	New Units Monitor Certification Deadline
X724	Yes		
X725	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		
	Yes		

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### XIII. Title IV Permit Application

Los Medanos Energy Center, LLC

Acid Rain - Page 2

Plant Name (from Step 1)

#### STEP 3

Read the  
standard  
requirements

#### Permit Requirements

- (1) The designated representative of each affected source and each affected unit at the source shall:
  - (i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and
  - (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each affected source and each affected unit at the source shall:
  - (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and
  - (ii) Have an Acid Rain Permit.

#### Monitoring Requirements

- (1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75.
- (2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
- (3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

#### Sulfur Dioxide Requirements

- (1) The owners and operators of each source and each affected unit at the source shall:
  - (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)), or in the compliance subaccount of another affected unit at the same source to the extent provided in 40 CFR 73.35(b)(3), not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
  - (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
- (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
- (3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
  - (i) Starting January 1, 2000, an affected unit under 40 CFR 72.8(a)(2); or
  - (ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.8(a)(3).
- (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
- (5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
- (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
- (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

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### XIII. Title IV Permit Application

Los Medanos Energy Center, LLC  
Plant Name (from Step 1)

Acid Rain - Page 3

STEP 3,  
Cont'd.

**Nitrogen Oxides Requirements** The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

**Excess Emissions Requirements**

- (1) The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
- (2) The owners and operators of an affected unit that has excess emissions in any calendar year shall:
  - (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
  - (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

**Recordkeeping and Reporting Requirements**

- (1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
  - (i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
  - (ii) All emissions monitoring information, in accordance with 40 CFR part 75, provided that to the extent that 40 CFR part 75 provides for a 3-year period for recordkeeping, the 3-year period shall apply.
  - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
  - (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.
- (2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

**Liability**

- (1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
- (2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
- (3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
- (4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.

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XIII. Title IV Permit Application

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Los Medanos Energy Center, LLC  
Plant Name (from Step 1)

Step 3,  
Cont'd.

**Liability. Cont'd.**

(5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.  
(6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans) and 40 CFR 78.11 (NO<sub>x</sub> averaging plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one affected unit shall not be liable for any violation by any other affected unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.  
(7) Each violation of a provision of 40 CFR parts 72, 73, 74, 76, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

**Effect on Other Authorities**

No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 shall be construed as:

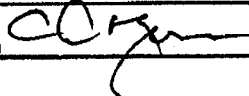
- (1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;
- (2) Limiting the number of allowances a unit can hold; *provided*, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;
- (3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
- (4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
- (5) Interfering with or impeding any program for competitive bidding for power supply in a State in which such program is established.

**STEP 4**

**Certification**

Read the  
certification  
statement,  
sign, and  
date

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name	Chris German
Signature	
Date	1/12/11

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## **APPENDIX E**

### **FIELD WORK SAFETY PLAN**



# FIELD WORK SAFETY PLAN

## Table of Contents:

1.0	Project Personnel Responsibilities
2.0	Training Requirements
3.0	Personal Protective Equipment
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5.0	Hearing Conservation
6.0	Hazardous Material and Chemical Use and Safety Guidelines
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## 1.0 Project Personnel Responsibilities

The on-site project manager, or test team leader, is responsible for generating, organizing and compiling this field work safety plan. The project manager is responsible for assuring that adequate training and safety briefing(s) for the activity are provided to those performing the field work. The project supervisor has provided a copy of this field work safety plan and has explained it to each member of the project team prior to field activities.

All test team members are responsible for following the field work safety plan. The test team's safety responsibilities include:

1. Following the field work safety plan.
2. Reporting any unsafe conditions or practices to the project manager.
3. Reporting to the project manager all facts pertaining to incidents which result in injury.
4. Reporting all equipment malfunctions or deficiencies to the project manager and the equipment supplier.
5. Meeting with plant safety personnel and following their site-specific emergency procedures and contractor safety programs.
6. Stop Work Policy – Enforce the stop work policy for any Avogadro operations that threaten the health and safety of the team.

The project manager has the on-site responsibility for ensuring that all team members comply with the field work safety plan. It is the project manager's responsibility to inform all other field personnel of physical and chemical hazards prior to starting work. The project supervisor's responsibilities also include:

1. Providing daily safety briefings for team members and visitors.
2. Updating equipment or procedures to be used at the facility based on any new information gathered at the site.
3. Inspecting all personal protective equipment (PPE) prior to use.
4. Documenting compliance with field work safety plan by completing forms used by The Avogadro Group, LLC.
5. Posting location and route to the nearest medical facility; arranging for emergency transportation to the nearest medical facility.
6. Posting emergency communications procedures.
7. Following all procedures for reporting unsafe conditions and practices.
8. Observing team members for signs of exposure, stress, or other conditions relating to physical conditions and/or work activities.
9. Maintaining site compliance in regards to all client and The Avogadro Group, LLC safety programs (i.e. Hazard Communication, PPE, Emergency Response, Hearing Conservation, Respiratory Protection, and hazardous substance use and safety)
10. Providing to all necessary personnel and agencies, upon request, copies of The Avogadro Group, LLC's written safety plans and documentation of employee training.

The project manager is responsible for reviewing and approving the draft field work safety plan for accuracy and incorporating new information or guidelines which aid the project manager or project supervisor in further definition and control of health and safety hazards associated with the project.

## **2.0 Training Requirements**

Each employee will be familiar with the requirements of this field work safety plan and will participate in site activity and safety briefings and orientation.

All Avogadro employees will have the following training completed as required to maintain both safety compliance and project safety:

Project Managers, Test Team Leaders and Field Technicians

- a. 40-hour HAZWOPER (Excluding Field Technicians)
- b. Hazard Communication,
- c. Emergency Response and Emergency Action Plan Training,
- d. Hearing Conservation,
- e. Respiratory Protection,
- f. Fall protection (including man-lift certification),
- g. Contractor Electrical Safety,
- h. PPE,
- i. Hand Power Tool Use/Safety,
- j. Ladder and Stairway Safety,
- k. Lifting and Back Safety,
- l. Lock Out/Tag Out Awareness,
- m. Confined Space Awareness,
- n. Fire Prevention and Protection,
- o. Behavior Based Safety, and
- p. First Aid/CPR Safety training

## **3.0 Personal Protective Equipment**

In addition to The Avogadro Group, LLC's field personnel dress code which includes the wearing of *long sleeved shirts* while at job sites, The Avogadro Group, LLC's minimum required personal protective equipment for all employees on-site at all Avogadro project sites includes:

- Hardhats,
- Steel toe work shoes (ANSI rated with leather tops),
- Safety glasses,
- Leather gloves, and
- Hearing protection (double hearing protection may be required at some sites)



Additional PPE may be required as needed to maintain both safety compliance and personal safety. These may include:

- Hot gloves,
- Fall protection safety harness,
- Chemical resistant gloves,
- Chemical resistant goggles with splash protection,
- Chemical resistant suit or apron (MINOR HAZMAT SPILL CLEAN UP ONLY),
- Heat shield and or heat protection suit with mask,
- Respirator, or
- N95 dust mask

Once an employee has successfully completed the training on the proper use, maintenance, and inspection of PPE, it is that employee's responsibility to ensure that his or her PPE is in proper working order.

#### **4.0 Emergency Response**

In the event of a plant emergency (i.e. fire, explosion, chemical release, medical emergency, etc) The Avogadro Group, LLC personnel are to follow the client's emergency procedures. Additional Avogadro procedures may be followed but are secondary to the client's procedures.

The Avogadro Group, LLC trains and equips their employees to handle many hazards that may occur on-site. Avogadro employees may assist in emergency procedures but are ultimately responsible for only Avogadro personnel, equipment, and materials. This includes chemicals and samples.

#### **5.0 Hearing Conservation**

All Avogadro personnel will follow The Avogadro Group, LLC's program for hearing conservation. In the event that a client's site requires more stringent protection, Avogadro personnel will adhere to the clients hearing conservation program.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

#### **6.0 Hazardous Material and Chemical Use and Safety Guidelines**

Avogadro may use various compressed gases and chemicals in small quantities throughout testing.

Avogadro will be operating under Materials of Trade guidelines for the transportation of these chemicals. All chemicals used by Avogadro employees are the sole property of The Avogadro Group, LLC and are not for sale under any circumstance.

Avogadro employees are to strictly follow The Avogadro Group, LLC's written Hazard Communications Program. All personnel will be required to follow proper procedure for labeling and use of hazardous materials and chemicals. This program contains The Avogadro Group, LLC's chemical labeling procedures, MSDS information, and chemical list. The project team may use a number of hazardous chemicals during the sampling and analyses of samples. Team members shall follow all safety procedures required in the sampling and analysis methods. Employees shall wear protective eyewear and protective gloves during sampling and during analysis. If splashed with chemicals, the affected areas shall be immediately rinsed in clean water or chemical rinse solution for a minimum of 15 minutes using an ANSI approved rinse device. Eye wash and chemical rinse stations will be available in the mobile laboratory. Medical attention shall be sought as necessary based on the exposure. Staff shall seek medical attention if there is any contact of chemicals with the eyes.

Avogadro will not be generating any hazardous waste during the normal course of testing. If a chemical spill occurs, all test team members are trained and equipped under HAZWOPER guidelines to respond to chemical spills of 1 gallon or less (1 liter or less for some acutely toxic chemicals) of all chemicals used by The Avogadro Group, LLC.

Copies of these programs must be made available to all employees, clients, and/or OSHA inspectors upon request. MSDSs are kept on-board every mobile laboratory and are made available to anyone.

## **7.0 Housekeeping**

All areas in and around testing will be kept clear of debris and refuse. All materials and equipment will be organized to limit tripping hazards.

## **8.0 First Aid**

All mobile laboratories will have a stocked and maintained OSHA approved first aid kits on board. These kits will contain basic items to treat only minor cuts, scrapes, and burns. If more than basic first aid is required, medical attention from a certified or trained person will be required.

All Avogadro employees are trained in First Aid and CPR. It is the role of the acting on-site supervisor to ensure proper First Aid is given to all injured Avogadro employees on-site within the confines of their training and to activate Emergency Medical Response if any injury needs medical treatment beyond what can be provided within the confines of their training. First Aid trained personnel employed by The Avogadro Group, LLC are only responsible to give First Aid to Avogadro employees.

Each employee will be made aware of the location and the contents of first aid kits brought on-site.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

## **9.0 Fire Protection and Prevention**

The Avogadro Group, LLC maintains ABC type fire extinguishers on-board all vehicles. Avogadro recognizes that some client's process may be damaged by the use of any "A" type fire extinguisher. In the event that any fire extinguisher must be brought on-site by The Avogadro Group, LLC, the Project Manager or Test Team Leader will ensure that only "B/C" type extinguishers are brought on-site.

All employees are required to follow plant procedures in regards to open flames and smoking. It is the responsibility of the plant to notify the test team of potential flame and fire hazards. In the event that the test requires the use of a flame (i.e. Flame Ionization Detection), the test team leader will be responsible for notifying the plant and following the plant's instructions for safely completing the test.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

## **10.0 Confined Space**

No Avogadro employee is required or will be required to enter any confined spaces.

All Avogadro employees will have awareness level training designed for avoiding confined spaces.

## **11.0 Respiratory Protection**

The Avogadro Group, LLC maintains a Respiratory Protection Program. All aspects of respiratory protection will be done by following this plan. Under no circumstances will any Avogadro employee perform any work that exceeds the limitations of this plan.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

## **12.0 Hand and Power Tool Use and Inspection**

Avogadro does not use any power tools in the course of testing.

All hand tools will be inspected by the user prior to use for signs of excessive wear and condition (rust, burrs, function ability, etc). All tools that are not fit for use will be removed from use, labeled, and replaced.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

### **13.0 Electrical Safety**

All Avogadro employees are trained to follow The Avogadro Group, LLC's Contractor Electrical Safety Plan.

The Avogadro Group, LLC utilizes many **NON-INTRINSICALLY SAFE EQUIPMENT** (i.e. Flame Ionization Detectors, meter boxes, etc.) in the course of normal testing. The Avogadro Group, LLC will notify the plant/company contact prior to powering equipment to ensure that plant safety precautions regarding use of non-intrinsically safe equipment are adhered to.

Employees are to never open panels, junction boxes, or other devices related to the plant power system. If it is necessary to have a device opened, a trained plant person is required to perform all necessary work. Lockout/tag out procedures are to be followed at all times. Observe all appropriate electrical safety procedures when working with electrical equipment of any voltage. Do not handle any exposed electrical conduit, wire, or conductor. Do not disturb any electrical transformer fluids. Avoid wet floors when performing any electrical work.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

All Avogadro employees are Lock Out/Tag Out aware only. If further Lock Out/Tag Out training is required for testing, either appropriate training will be done prior to showing up on-site or a qualified person will perform on-site training. Whichever meets the requirements of the job.

The Avogadro Group, LLC does not own, operate or work on any "energized equipment."

### **14.0 Fall Protection and Manlift Operation**

All Avogadro employees are trained to follow The Avogadro Group, LLC's Fall Protection Plan.

A copy of this program must be made available to all employees, clients, and/or OSHA inspectors upon request.

### **15.0 Traffic**

The Avogadro Group, LLC has established a Driving Safety Program to ensure that all company vehicles are driven and maintained in a safe and healthy manner. Only those employees who have been accepted by Avogadro's automobile insurance company are authorized to drive a motor vehicle on the behalf of the company in the course and scope of work or operate a company owned vehicle. The program is intended to prevent employee injuries and to minimize Avogadro's exposure to loss. The primary goals of the program are as follows:

- To require that all employees driving on behalf of Avogadro drivers must maintain both a current valid motor vehicle license and acceptable driving records.
- To train employees in safe driving practices.

Avogadro employees who drive a company or company rented vehicle or who drive a personal or rented vehicle on behalf of Avogadro must follow general safety controls.

- All drivers and passengers must wear seatbelts.
- Always operate the vehicle in a safe manner.
- Drivers must always use vehicles of the correct size and for the intended use.
- Drivers must always secure all loads and do not exceed the manufacturer's specifications and legal limits for the vehicle.
- Never drive if your vision, hearing, or alertness is impaired due to fatigue, illness, or any other cause. In such instances, Avogadro encourages the use of alternative forms of transportation.
- Never drive while under the influence of alcohol, illegal drugs, prescriptions, or over-the-counter medications that might impair their driving skills.
- Drivers must refrain from using cellular or other communication devices, personal listening devices, and from conducting any other activities which may impede the driver's ability to focus on safely operating the vehicle while it is in motion.
- Writing, sending, or reading text-based communication, including text messaging, instant messaging, operating applications, and e-mail, on a wireless device or cellular phone while driving is prohibited.
- Always drive within the speed limit. (No driver will be required to meet a schedule that would necessitate exceeding the speed limit.)
- Always obey all traffic laws, ordinances, traffic signals, and road signs.

To avoid hazards associated with traffic, employees should be aware of traffic movement at all times and are required to follow all plant safety procedures regarding traffic safety.

## **16.0 Job Site Hazard Identification**

The potential hazards to personnel working at the subject site have been identified as physical hazards of working around equipment (mechanical and electrical equipment, temporary power lines/cables, noise), slips/falls, fatigue, heat stress, and exposure to chemicals. Each potential hazard is described below. Note: this is not an all-inclusive list. Some sites may have additional hazards, which will be included in as an attachment. See attachment 18.1 "Potential Refinery Hazards."

Some work sites may have specific hazards, such as the possibility of exposure to equipment which incorporates the use of asbestos, or exposure to specific hazardous chemicals which approach the OSHA or NIOSH permissible exposure limits.<sup>1</sup> In general, we do not expect to be exposed to these health hazards. If the hazards do exist at particular work sites, it will be the client's responsibility to provide affected Avogadro employees training so that they can complete their tasks safely.

## **16.1 Physical and Health Hazards**

The physical and health hazards can include traffic, working near heavy equipment, working near automatic equipment, temporary and permanent power lines, overhead hazards, pulling and lifting of equipment, slips and falls, climbing and elevated work, chemical exposure, above ground temporary piping, noise, and heat exposure.

## **16.2 General**

Employees must use common sense and follow identified safety procedures when performing field work. Employees are not to climb over or remove any protective barriers unless trained and authorized to do so and proper safety procedures have been implemented. All employees can refuse to perform any field work if they feel they are overly tired, nauseous and/or fatigued to the point that test team and personal safety is at risk. Extreme care must be used when climbing ladders and working on access platforms. Employees must watch and pay careful attention to where they are walking. Employees are to be aware of wet areas and other slip hazards, as they are very common to our everyday activities. There shall be no running.

## **16.3 Plant Equipment**

Employees should be aware of moving parts, which could cause injury when working near equipment. Watch for rotating equipment hazards. Employees are not to remove any guards or protective barriers. Noise levels can be high near operating equipment; hearing protection is to be worn on site at all times.

## 16.4 Sun, Heat and Cold

Other physical hazards include heat stress or cold stress depending on what the weather is like when the work takes place.

### **Heat Illness Prevention CA OSHA Regulation, Title 8 Section 3395**

Applies to all outdoor places of employment.

#### **Training**

Training must be provided to all supervisory and non-supervisory employees in:

- Identifying, evaluating and controlling exposures & symptoms.
- The importance of acclimatization
- Company procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider.
- Company procedures for ensuring that, in the event of emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.
- Control measures
- The importance of drinking water
- Risk factors
- Emergency procedures
- Employee rights
- Employer responsibility
- **Supervisors must be trained in heat related illness prior to supervision of employees working in the heat. Including procedures to prevent heat illness and procedures to follow when an employee shows symptoms of heat illness.**

#### **Environmental factors**

- Working conditions where the possibility of heat illness could occur
- Working in direct sunlight
- Ambient temperature 85° or above
- Required PPE
- Humidity
- Workload and duration

**Risk Factors**

- Unaccustomed to working in heat
- Physical exertion-work at a steady pace-avoid over exertion
- Medications
- Wearing PPE that traps body heat
- Physical fitness
- Age-older people may have less body water and lower sweat efficiency
- Lack of water consumption

**Water**

- Employers are required to provide access to potable drinking water in sufficient quantity at the beginning of the work shift.
- Provide 1 quart per employee per hour per shift
- 1 quart x 8 hrs. = 2 Gallons for every employee/day

**Shade**

- At or below 85 degrees Fahrenheit the employee shall have timely access to shade upon request. For temperatures at or above 85 degrees Fahrenheit, one or more areas with shade shall be provided at all times while employees are present. Shade shall accommodate at least 25% of employees on shift at any one time.
- Employees “suffering from heat illness or believing a preventative recovery period is needed shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes.”
- Encourage employees to have a rest break.

**FIND SHADE!**

- “Shade” means blockage of direct sunlight.
- Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool.
- A vehicle is to be used to provide shade only if the AC is on, so it can be used to cool the body.



**High-Heat Procedures**

- Employer shall implement high-heat procedures when the temperature equals or exceeds 95° F.
- Supervisors must
  - Ensure effective communication is maintained.
  - Observe employees for alertness and signs or symptoms of heat illness.
  - Remind employees throughout the work shift to drink plenty of water.
  - Maintain close supervision of a new employee for the first 14 days.

**Heat Stress**

- Occurs when the total heat load on the body exceeds the body's capacity to cool itself.
- Can result in fatigue, skin rashes, and decreased mental alertness that can be a contributor to poor judgment and accidents
- If not prevented, results in heat stress illnesses. Two critical illnesses, if not recognized and treated immediately, can become life threatening. These are heat exhaustion and heat stroke.

**Heat Cramps**

- Heat cramps occurs when the body loses too much salt
- What to do
  - DRINK WATER
  - Replace salt or potassium by drinking electrolyte solutions such as sports drinks eating potassium-rich foods like bananas.

### **Heat Exhaustion**

- Heat exhaustion – the body can't replace fluids/salt lost in sweating
- **The signs and symptoms of heat exhaustion are:**
  - Headache
  - Dizziness
  - Nausea
  - Weakness
  - Fainting
  - Profuse sweating
  - Loss of appetite
  - Dilated pupils
  - Weak and rapid pulse
  - Shallow and rapid breathing
  - Possible cramps in abdomen and extremities
  - Possible vomiting
  - Difficulty walking
  - Cool and sweaty skin to the touch pale to ashen gray coloring.

### **First Aid for Heat Exhaustion is as follows**

- Immediately remove victim to the support area, or if you are the victim proceed to the support area.
- It is important to report to your supervisor any symptoms or signs of heat illness in yourself or your co-workers.
- Start cooling but be careful not to cause a chill (i.e., rest in shade and apply wet towel to forehead; open up and/or remove clothing as much as practical)
- Elevate feet 8-12 inches
- Drink cool water slowly, but only if conscious and not in shock
- If vomiting, and/or the signs and symptoms are not lessening within an hour, **call 911 or the local emergency number** for emergency help and/or transport the victim to emergency room.
- It is likely that a heat exhaustion victim will be unable to work for the remainder of the day.

## **Heat Stroke – DANGER**

- Heat Stroke – the body no longer sweats and holds so much heat that the body temperature reaches dangerous levels.
- Heat stroke is an immediate, life-threatening condition that results because the body's heat regulating mechanisms shut down and the body cannot cool itself sufficiently. As heat is excessively stored in the body, brain damage can result causing permanent disability or death
- Can lead to delirium, convulsions, unconsciousness and death.
- **The signs and symptoms of heat stroke are:**
  - hot, dry skin to the touch
  - reddish coloring
  - body temperature >105 degrees F
  - no sweating
  - mental confusion
  - deep, rapid breathing that sounds like snoring progressing to shallow, weak breathing
  - headache
  - dizziness
  - nausea
  - vomiting
  - weakness
  - dry mouth
  - convulsions
  - muscular twitching
  - sudden collapse
  - possible unconsciousness

**Heatstroke is a life-threatening situation. If you suspect someone is suffering from heatstroke, call 9-1-1 or the local emergency number immediately.**

**First aid for heat stroke is as follows:**

- Move the person to a cool place
- Loosen tight clothing
- Remove perspiration soaked clothing
- Apply cool, wet cloths to the skin.
- Fan the person
- If conscious, give small amounts of cool water to drink.
- Place the person on his or her side
- Continue to cool the person by using ice or cold packs on the wrists, ankles, groin, neck and in the armpits.
- Continue to check breathing and circulation.

**Review Control Measures at Tailgate Meetings**

- Ensure that there is at least 2 gallons of water for each employee for each 8 hour shift.
- Point out areas that may provide shade at your work site.
- Include on JHA
- Include work/rest cycles so that rest periods are taken before excessive fatigue occurs.
- Heat prevention procedures shall be in writing and made available to employees.
- Discuss how employees will call for help.

**DRINK WATER!!**

- Drink water before and during work in the heat.
- Avoid alcohol and caffeine.
- Plain water, served cool, is excellent. An adequate supply of potable water and drinking cups will be readily available, to provide water during rest periods.

Each workday you start out by putting on your PPE

- Hard Hat
- Safety glasses or Safety goggles
- Steel Toed Boots
- Gloves
- Ear Plugs
- Long sleeved shirts – Dress code

### **CDC Recommends**

- Use sunscreen with a sun protective factor (SPF) 15 or higher, and both UVA and UVB protection.
- Wear clothing to protect exposed skin
- Wear a hat with a wide brim to shade the face, head, ears and neck.
- Wear sunglasses that wrap around and block as close to 100% of both UVA and UVB rays as possible.
- Seek shade, especially during midday hours.
- **EVERYBODY IS AT RISK FOR SKIN CANCER**

### **Cold Stress**

The potential for cold stress is a particular concern when field activities are performed while air temperatures at the site are below 40 degrees F. Limit exposure to outside work during temperature and wind chill extremes and use the correct PPE for any outside work.

#### **Environmental Factors**

- Working outside during temperature and wind chill extremes
- Not wearing the required appropriate PPE.
- Pay special attention to protection of the face, head, hands, wrists and feet.

#### **Risk Factors**

- Unaccustomed to working in extreme cold.
- Medications.
- Drugs such as nicotine or caffeine because of their diuretic circulatory effects can increase susceptibility to cold.
- Workers with cold or flu or certain diseases, such as diabetes, heart, vascular, and thyroid problems may be more susceptible to the winter elements.
- Becoming exhausted or immobilized, especially due to injury can speed up the effects of the cold weather.

### **Hypothermia**

Hypothermia is the lowering of the body core temperature to the point where it is no longer functioning properly.

Symptoms include:

- Intense shivering.
- Poor coordination, stumbling.
- Loss of memory.
- Thickness of speech and drowsiness.

Hypothermia is insidious, and left untreated, may result in collapse and death.

## **Dehydration**

Dehydration, or the loss of body fluids, occurs gradually in the cold environment and may increase the susceptibility of workers to cold injury due to a significant change in blood flow to the extremities.

- Warm, sweet drinks and soups should be taken to the work site to provide caloric intake and fluid volume.
- Taking certain medication or drugs such as nicotine, or caffeine because of their diuretic circulatory effects can increase susceptibility to cold.

## **Treatment**

Prevent further heat loss, contact emergency services, and transport as soon as possible as directed to a medical facility.

## **Frostbite**

Frostbite is the freezing of body tissue. It may range from minor injury (“frost nip”) to complete freezing of an extremity. Untreated frostbitten areas will first become reddened and then become gray or white, particularly on exposed ear lobes, cheeks, or nose. Left untreated, the skin becomes numb and dead white. Watch co-workers for signs of frostbite.

## **Treatment**

Transport as soon as possible to a medical facility.

## **17.0 Documentation**

All documentation will be made available to all employees, clients, and/or OSHA inspectors upon request. This documentation includes daily site safety meetings, training records, training tests, and written plans.

## **18.0 Attachments**

## 18.1 Potential Refinery Hazards

### POTENTIAL REFINERY HAZARDS

The Avogadro Group, LLC performs source testing at refineries such as the ConocoPhillips refinery in Rodeo, CA and the Martinez Refining Company (previously known as the Shell refinery) in Martinez, CA. There are certain health hazards specific to refineries that our employees should be aware of.

Asbestos was used in the construction of the refineries before its use was banned. Attached is an OSHA fact sheet which contains information regarding the health hazards associated with exposure to asbestos particles. Due to the nature of our work, we do not believe our employees will ever be exposed to asbestos at refineries.

Additional health hazards specific to refineries are exposure to benzene, cadmium, lead, and hydrogen sulfide which are all either produced by or used in petroleum refining operations. The permissible exposure limit (PEL) for benzene in air is 1 ppm based on a time-weighted average during an 8 hour work day. We do not expect to work in areas where the concentration of benzene approaches this PEL. We also do not expect to work in areas which contain significant amounts of liquid benzene.

Exposure to cadmium usually results from working around processes in which cadmium-laden ores are processed. The primary exposure pathway for cadmium is by breathing air which is contaminated with cadmium dust. Cadmium is particularly toxic with a PEL of 5 micrograms per cubic meter. We do not expect to work in areas where this concentration of cadmium is present.

Lead exposure can occur via exposure to breathing air contaminated with lead and by contact through the skin with liquids which contain lead. The PEL for airborne lead is 50 micrograms per cubic meter. We do not expect to work in areas where this concentration of lead is present. We also do not expect to work in areas where exposure to liquids containing lead is a possibility.

Hydrogen sulfide is a byproduct of refinery operations. The NIOSH PEL based on a ten minute time-weighted average is 10 ppm. Exposure to air with a concentration of 100 ppm can be fatal. We do not expect to work in areas where the concentration of hydrogen sulfide approaches the PEL.

It is our policy to ascertain from our refinery clients whether exposure to asbestos, cadmium, lead, and hydrogen sulfide at levels approaching the permissible exposure limits will be likely. If, in the unlikely event that we will be working in an area of the refinery where exposure to these particular health hazards is a possibility, it will be the client's responsibility to provide the affected Avogadro employees training so that they can complete their tasks safely.

## **DANGER**

ASBESTOS  
CANCER AND LUNG  
DISEASE HAZARD  
AUTHORIZED  
PERSONNEL ONLY  
RESPIRATORS AND  
PROTECTIVE  
CLOTHING ARE  
REQUIRED IN THIS  
AREA

# OSHA **FACT** Sheet

## Asbestos

### **What is asbestos?**

Asbestos is the name given to a group of naturally occurring minerals used in certain products, such as building materials and vehicle brakes, to resist heat and corrosion. Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these materials that have been chemically treated and/or altered.

### **What are the dangers of asbestos exposure to workers?**

The inhalation of asbestos fibers by workers can cause serious diseases of the lungs and other organs that may not appear until years after the exposure has occurred. For instance, asbestosis can cause a buildup of scar-like tissue in the lungs and result in loss of lung function that often progresses to disability and death. Asbestos fibers associated with these health risks are too small to be seen with the naked eye, and smokers are at higher risk of developing some asbestos-related diseases.

### **Are you being exposed to asbestos?**

General industry employees may be exposed to asbestos during the manufacture of asbestos-containing products or when performing brake and clutch repairs. In the construction industry, exposure occurs when workers disturb asbestos-containing materials during the renovation or demolition of buildings. Employees in the maritime environment also may be exposed when renovating or demolishing ships constructed with asbestos-containing materials. In addition, custodial workers may be exposed through contact with deteriorating asbestos-containing materials in buildings.

### **Are there any OSHA standards that cover workers exposed to asbestos?**

Yes. The Occupational Safety and Health Administration (OSHA) has the following three standards to protect workers from exposure to asbestos in the workplace:

- 29 *CFR* 1926.1101 covers construction work, including alteration, repair, renovation, and demolition of structures containing asbestos.
- 29 *CFR* 1915.1001 covers asbestos exposure during work in shipyards.
- 29 *CFR* 1910.1001 applies to asbestos exposure in general industry, such as exposure during brake and clutch repair, custodial work, and manufacture of asbestos-containing products.

The standards for the construction and shipyard industries classify the hazards of asbestos work activities and prescribe particular requirements for each classification:

- Class I is the most potentially hazardous class of asbestos jobs and involves the removal of thermal system insulation and sprayed-on or troweled-on surfacing asbestos-containing materials or presumed asbestos-containing materials.
- Class II includes the removal of other types of asbestos-containing materials that are not thermal system insulation, such as resilient flooring and roofing materials containing asbestos.
- Class III focuses on repair and maintenance operations where asbestos-containing or presumed asbestos-containing materials are disturbed.
- Class IV pertains to custodial activities where employees clean up asbestos-containing waste and debris.

There are equivalent regulations in states with OSHA-approved state plans.

### **What are the permissible exposure limits for asbestos?**

Employee exposure to asbestos must not exceed 0.1 fiber per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. Short-term exposure must also be limited to not more than 1 f/cc, averaged over 30 minutes. Rotation of employees to achieve compliance with either permissible exposure limit (PEL) is prohibited.

### **Are employers required to conduct exposure monitoring?**

In construction and shipyard work, unless you are able to demonstrate that employee exposures will be below the PELs (a "negative exposure assessment"), you are generally required to conduct daily monitoring for workers in Class I and II regulated areas. For workers in other operations where exposures are expected to exceed one of the PELs, you must conduct periodic monitoring. In general industry, you must perform initial monitoring for workers who may be exposed above a PEL or above the excursion limit. You must conduct subsequent monitoring at reasonable intervals, and in no case at intervals greater than 6 months for employees exposed above a PEL.

### **Must employers create regulated areas?**

You must create controlled zones known as regulated areas that are designed to protect employees where certain work with asbestos is performed. You must limit access to regulated areas to authorized persons who are wearing appropriate respiratory protection. You must also prohibit eating, smoking, drinking, chewing tobacco or gum, and applying cosmetics in these areas. You must display warning signs at each regulated area. In construction and shipyards, workers must perform Class I, II, and III asbestos work (and all other

## **18.2 OSHA Fact Sheet: Asbestos**



operations where asbestos concentrations may exceed a PEL) within regulated areas. In general industry, you must establish regulated areas wherever asbestos concentrations may exceed a PEL.

## What compliance methods must employers use to control exposures?

You must control exposures to or below the PELs using engineering controls and work practices to the extent feasible. Where feasible engineering controls and work practices do not ensure worker protection at the exposure limits, you must reduce employee exposures to the lowest levels achievable and then supplement them with respiratory protection to meet the PELs. In construction and shipyards, each work classification has specific control method requirements. In general industry, specific controls are prescribed for brake and clutch repair work. For example, you must prohibit certain practices, such as the use of compressed air, to remove asbestos.

## When are employers required to provide respiratory protection for workers?

You must provide and ensure the use of respirators when a PEL is exceeded. In construction and shipyards, you must require workers to use respirators when performing certain work. Generally, the level of exposure determines the type of respirator needed. In addition, the standards specify the type of respirator to be used for certain asbestos work. (See *CFR* 1910.134.) Employees must get respirator training and medical clearance to use respirators.

## Are employers required to provide protective clothing for workers?

Yes. For any employee exposed to airborne concentrations of asbestos that exceed a PEL, you must provide and require the use of protective clothing such as coveralls or similar full-body clothing, head coverings, gloves, and foot coverings. You must provide face shields, vented goggles, or other appropriate protective equipment wherever the possibility of eye irritation exists and require workers to wear them.

## Must employers provide hygiene facilities?

Yes. You must establish decontamination areas and hygiene practices for employees exposed above a PEL. In addition, employees may not smoke in work areas that might expose them to asbestos.

## Do OSHA standards require employers to provide training?

Yes. In construction and shipyards, you must provide training for employees exposed above a PEL and for employees involved in each identified work classification. The specific training requirements depend upon the particular class of work being performed. In general

industry, you must provide training to all employees exposed above a PEL. You must also provide asbestos awareness training to employees who perform housekeeping operations covered by the standard. You must place warning labels on all asbestos products, containers, and installed construction materials when feasible.

## What are employers required to provide concerning medical examinations?

In construction and shipyards, you must provide medical examinations for workers who, for 30 or more days per year, engage in Class I, II, or III work or experience exposure above a PEL. In general industry, you must provide medical examinations for workers who are exposed above a PEL.

## What are the recordkeeping requirements for asbestos exposures?

You must keep accurate records of the following:

- All measurements taken to monitor employee exposure to asbestos—30 years;
- Medical records, including physician's written opinions—duration of the employee's employment plus 30 years; and
- Training records—1 year beyond the last date of employment.

## How can you get more information on safety and health?

OSHA has various publications, standards, technical assistance, and compliance tools to help you, and offers extensive assistance through workplace consultation, voluntary protection programs, grants, strategic partnerships, state plans, training, and education. OSHA's *Safety and Health Program Management Guidelines* (*Federal Register* 54:3904-3916, January 26, 1989) detail elements critical to the development of a successful safety and health management system. This and other information are available on OSHA's website.

- For one free copy of OSHA publications, send a self-addressed mailing label to OSHA Publications Office, P.O. Box 37535, Washington, DC 20013-7535; or send a request to our fax at (202) 693-2498, or call us at (202) 693-1888.
- To order OSHA publications online at [www.osha.gov](http://www.osha.gov), go to **Publications** and follow the instructions for ordering.
- To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the "U.S. Department of Labor" listing in your phone book, or call toll-free at (800) 321-OSHA (6742). The teletypewriter (TTY) number is (877) 889-5627.
- To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website.

This is one in a series of informational fact sheets highlighting OSHA programs and standards. It does not impose any new compliance requirements or carry the force of legal opinion. For compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory impaired individuals upon request. Voice phone is (202) 693-1999. See also OSHA's website at [www.osha.gov](http://www.osha.gov).



U.S. Department of Labor  
Occupational Safety and Health Administration  
2002

# JOB HAZARD ANALYSIS FORM

(to be included with all Test Protocols and Field Work Safety Plans)

Project Name: Calpine LMEC

Project Number: 16046.0

Project Manager: Andrew Berg

Test Team Leader: N/A

Date: 8/15-19/2016

## Pollutants of concern:

☒

CO

☒

NO<sub>x</sub>

☐

SO<sub>2</sub>

☒

VOC

☐

other

If other, explain:

\_\_\_\_\_

## Approximate pollutant concentrations, (ppm):

☒

below 100

☐

100 to 1,000

☐

1,000 to 5,000

☐

above 5,000

☐

other

If other, explain:

\_\_\_\_\_

## Approximate flue gas temperatures, (°F):

☐

below 210

☒

210 to 450

☐

450 to 950

☐

above 950

☐

other

If other, explain:

\_\_\_\_\_

## Approximate duct pressures, (iwg):

☐

below -3

☒

-3 to +3

☐

+3 to +7

☐

above +7

☐

other

If other, explain:

\_\_\_\_\_

## Approximate sampling platform height, (ft):

☐

below 6

☐

6 to 50

☐

50 to 100

☒

above 100

☐

other

If other, explain:

\_\_\_\_\_

## Safety barriers around sampling platform:

☒

toe plate

☒

safety rails

☒

tie off point

☐

heat shield

☐

other

If other, explain:

\_\_\_\_\_

# JOB HAZARD ANALYSIS FORM

(to be included with all Test Protocols and Field Work Safety Plans)

## Excessive noise, (decibels):

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
below 85	85 to 100	100 to 110	above 110	other

If other, explain:

## Hazardous atmosphere:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
chemical	explosive	biological	fugitive dust	other

If other, explain:

N/A

## Ambient conditions:

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
inside	outside	wet	slippery	noisy
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot	cold	vibration	dusty	other

If other, explain:

## Physical demands:

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
lifting	pulling	bending	kneeling	squatting
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
standing	pushing	sitting	grasping	other

If other, explain:

## Personal protective equipment:

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
hard hat	ear plugs	ear muffs	safety glasses	goggles
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
leather boots	hard-toe boots	respirators	dust masks	SCBA
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
gloves	long-sleeves	cold suit	thermal clothes	other

If other, explain:

**Driving Directions: Calpine Corporation– Delta Energy Center  
1200 Arcy Lane, Pittsburg, CA 94565**

**Emergency Phone Numbers, Medical Care Facilities,  
and Driving Directions**

**Primary Emergency Numbers and Facilities:**

**NOTE: 911 service is available in this area from a land line.  
Cell phone use for dialing 911 is NOT recommended.**

**Occupational Medical Center:** (Approximate Distance: 13 miles)

MUIR/DIABLO OCCUPATIONAL MEDICINE

2231 Galaxy Ct, Concord, CA .....925/685-7744

Hours:

Monday – Friday: 8:00am – 7:00pm

Saturday – Sunday: 9:00am – 2:00pm

**Primary ER:** (Approximate Distance: 5 miles)

SUTTER DELTA MEDICAL CENTER

3901 Lone Tree Way, Antioch, CA .....925/779-7200 (INFO)

.....925/779-7243 (ER)

**Driving Directions and Map to Emergency Room/Medical Care:**

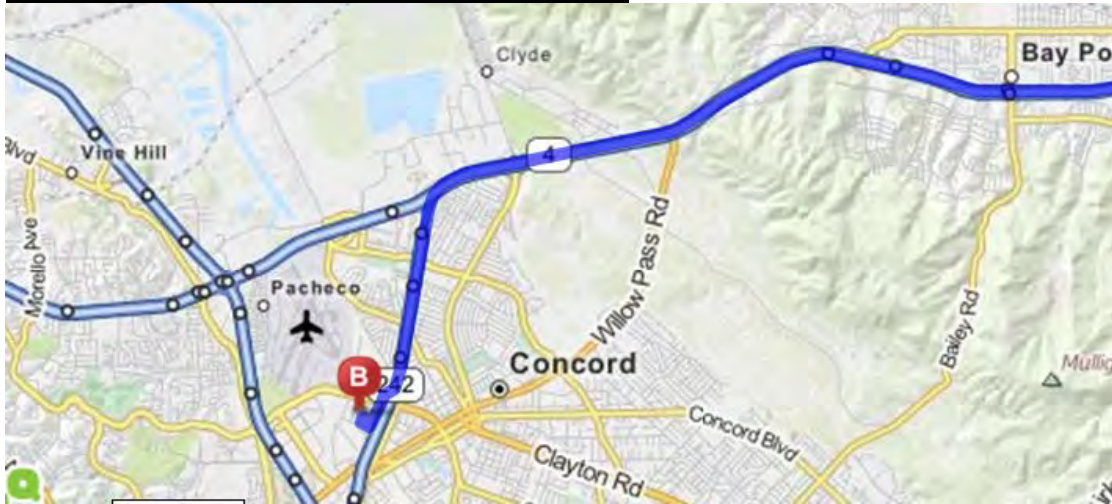
**Occupational Medical Center:**

1. Start out going south on Arcy Lane toward Pittsburg Antioch Hwy
2. Turn right onto Pittsburg Antioch Hwy
3. Turn 1<sup>st</sup> left onto Loveridge Rd
4. Turn slight right onto California Ave
5. Merge onto CA-4 W via the ramp on the left toward Oakland
6. Merge onto CA-242 S toward Oakland/Concord
7. Take the Concord Ave exit, Exit 1C
8. Stay straight to go onto Commerce Ave
9. Take the 2<sup>nd</sup> right onto Galaxy Way
10. Take the 1<sup>st</sup> right onto Galaxy Ct
11. Medical Center is on the left

**Primary ER:**

1. Start out going South on Arcy Ln. toward Pittsburg Antioch Hwy.
2. Turn Left onto Pittsburg Antioch Hwy.
3. Pittsburg Antioch Hwy becomes W. 10<sup>th</sup> St.
4. Turn Right onto Auto Center Dr.
5. Merge onto Hwy 4E via the ramp on the Left toward Stockton
6. Take the Lone Tree Way exit toward A Street
7. Turn Right after exit to merge onto Lone Tree Way
8. Keep Straight on Lone Tree Way.
9. Hospital will be on the Left.

**Muir/Diablo Occupational Medical Center**



**Sutter Delta Medical Center – Primary ER**

